

AD-A236 006



2

Massing The Third Dimension In AirLand  
Battle-Future: The Aviation Division

DTIC

A Monograph  
by

Major William M. Jacobs  
Aviation



School of Advanced Military Studies  
United States Army Command and General Staff College  
Fort Leavenworth, Kansas

First Term AY 90-91

Approved for Public Release; Distribution Is Unlimited

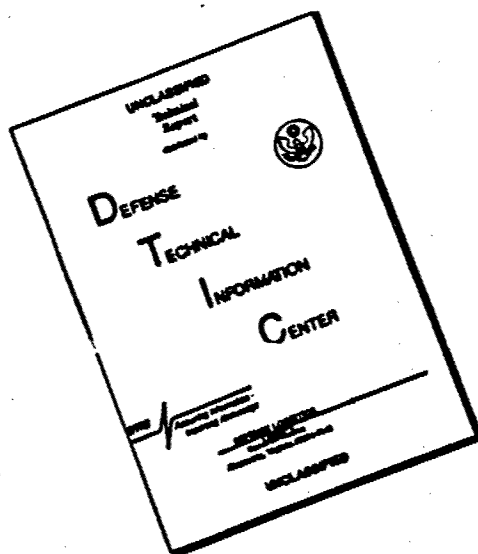
91 5 22 148

91-00388



BEST AVAILABLE COPY

# DISCLAIMER NOTICE



THIS DOCUMENT IS BEST  
QUALITY AVAILABLE. THE COPY  
FURNISHED TO DTIC CONTAINED  
A SIGNIFICANT NUMBER OF  
PAGES WHICH DO NOT  
REPRODUCE LEGIBLY.

# REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 12/90	3. REPORT TYPE AND DATES COVERED MONOGRAPH
4. TITLE AND SUBTITLE MASSING THE THIRD DIMENSION IN AIRLAND BATTLE-FUTURE: THE AVIATION DIVISION			5. FUNDING NUMBERS
6. AUTHOR(S)  MAJ WILLIAM H. JACOBS, USA			8. PERFORMING ORGANIZATION REPORT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES ATTN: ATZL-SWV FORT LEAVENWORTH, KANSAS 66027-6900 COM (913) 684-3437 AUTOVON 552-3437			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.			12b. DISTRIBUTION CODE
13. ABSTRACT (Maximum 200 words) SEE ATTACHED PAGE			
14. SUBJECT TERMS AIRLAND BATTLE AVIATION ATTACK HELICOPTERS AIRLAND BATTLE-FUTURE DEEP OPERATIONS AIR MANEUVER AVIATION DIVISION			15. NUMBER OF PAGES 40
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED

School of Advanced Military Studies  
Monograph Approval

Name of Student : Major William M. Jacobs  
Title of Monograph: Passing the Third Dimension in Airland  
Battalion: The Aviation Division

Approved by:

*J. H. Townsend* Monograph Director  
Lieutenant Colonel James W. Townsend, MA



*Gordon F. Atcheson* Director, School of Advanced  
Military Studies  
Colonel Gordon F. Atcheson, MA

*Philip J. Brookes* Director, Graduate Degree Programs  
Philip J. Brookes, Ph.D.

Accepted this 31st day of December 1960.

Approved for	
File	<input checked="" type="checkbox"/>
Dist. 1-3	<input type="checkbox"/>
Dist. 4-6	<input type="checkbox"/>
Justification	
by	
Distribution	
Availability	
Approved for	
Special	
A-1	

## ABSTRACT

**MASSING THE THIRD DIMENSION IN AIRLAND BATTLE-FUTURE: THE AVIATION DIVISION**, by Major William M. Jacobs, USA 40 pages.

This study examines the concept of fielding an Army aviation division as a viable options for deep attack execution in AirLand Battle Future.

First the study synthesizes the key elements of AirLand Battle Future (ALB-F), then it determines the future role of Army aviation during the ALB-F transition. Next the study examines the points of view of six key theorists related to the massing and application of rotary wing aviation in the context of deep battle. Then history from the Korean War to the present is reviewed to trace the tactical and technological evolution of Army aviation in its wartime role. Throughout this historical period, Army aviation has grown in size, mass, and efficiency.

At several junctures throughout the past 40 years, reorganizations have occurred internally, and in other allied nations, to eliminate piecemealing and to increase the massing of aviation. This study explores these French, German, and American organizational precedents which have already been successfully fielded, or are about to be as in the case of the German Airmobile Division in German "Army Structure 2000". These changes have ultimately lead to the new American division-sized organization which is proposed in Chapter 4. Then, in Chapter 5, Southwest Asia (SWA) is offered as the most appropriate scenario to fight this new division in view of current conditions because it best showcases the combination of tactics and technology on the future battle field.

The study imposes criteria from the capstone aviation manual, that of the Essential Aviation tasks, to evaluate and analyze the proposed Army aviation division in its ability to perform across the full spectrum of conflict in the combat, combat support, and combat service support roles.

This monograph finds that an Army aviation division is not only a viable third dimension transition to AirLand Battle Future, but it is the most logical and economical application of massed combat power at the disposal of the corps commander. As examined within, the formulation of the Army aviation division best prepares us for success in our "future first battles".

This study concludes that the organization of the Army aviation division is a viable part of the solution to right AirLand Battle Future. Further, its formulation merely formalizes the ad hoc task organizations that have already taken place in battle simulations and in the field in order to mass the requisite firepower to kill large enemy tank concentrations.

Additionally, this treatise concludes that the helicopter will continue to evolve technologically as the combat vehicle of choice, and that the aviation division is the ideal sized organization for the massed employment of its state-of-the-art combat firepower in the deep attack.

## TABLE OF CONTENTS

### Page

1	Title Page
11	Monograph Approval
111	Abstract
1v	Table of Contents
1	I. Introduction
	1. The Human Element
	2. AirLand Battle Future
	3. The Role Army Aviation in ALB-F
7	II. Theory
	1. Douhet
	2. Tukhachevsky
	3. Senger und Etterlin
	4. Simpkin
	5. Liddell-Hart
	6. Fuller
13	III. History
	1. Helicopter Historical Overview
	a. From Korea to 1962 Howze Board
	b. Prelude to Vietnam
	2. Vietnam
	a. Background of the Airmobile Concept
	b. Ia Drang Campaign
	3. Lebanon 1982
	4. Iran-Iraq
22	IV. Models for Concept Development
	1. The Current Corps Aviation Brigade
	2. Precedents for an Army Aviation Division
	a. The 4th Airmobile Division (French)
	b. German "Army Structure 2000"
	3. Proposed Army Aviation Division Model
27	V. Future Aviation Division Battle Scenario
	1. Overview
	2. The 47th Assault Division (Notional)
32	VI. Analysis and Evaluation
	1. Overview
	2. The Air Maneuver Concept
	3. The Essential Aviation Tasks
	a. Support the Force Commander's Plan
	b. Support Forces in Contact
	c. Synchronize Force Operations
	d. Sustain Force Operations
	4. Limitations
37	VII. Conclusions
40	VIII. Implications
41	IX. Figures
XX	X. Endnotes
43	XI. Bibliography

## MASSING THE THIRD DIMENSION IN AIRLAND BATTLE-FUTURE.

### THE ARMY AVIATION DIVISION

#### 1. INTRODUCTION

The US has been Army historically unprepared to win the first battle. Now, it is said that we must be prepared to fight outnumbered and win. "The first battle could be the last battle."  
General William E. DePuy.

The purpose of this paper is to analyze a proposed Army aviation division, arguably the evolutionary product of airmechanization theory, as a tactically viable concept to mass the "third dimension" in AirLand Battle Future (ALB-F). Historically, helicopters have played a major role in virtually all US Army war experiences since the Korean War and are presently integrated into all contingency war plans across the operational continuum. In The Future of Land Warfare, Chris Bellamy asserts that the "helicopter is usurping the role which many in the 1930s envisaged for tanks", striking deep and precisely at the enemy.<sup>1</sup>

To explore the past, present, and future roles of the helicopter, six theorists are selected in Chapter 2 to study their thoughts regarding the mass employment of rotary-wing assets for application in the deep battle. It should be noted that our Soviet competitors with their age-old emphasis on pursuit, exploitation and deep battle, clearly have similar applications in mind and share our doctrine to limited extent.

Other major land powers, especially France and Germany, also share our doctrine, and have built compelling cases for large unit helicopter operations. In the future, they are planning to have enough helicopters to insert large attack helicopter formations deep against the enemy in exploitation and pursuit roles. This monograph explores in detail these precedents as possessing the potential for U.S. modeling in the third dimension through AirLand Battle Future force design.

The way for us to control the future is to design it: in the transition to the Army of Quality (AOQ) and to AirLand Battle Future, we must keep in mind the very essence of our business is to be capable of fighting without prior notice anywhere in the world against any foe, singularly or in coalition. In analyzing how we prepare to do this it is important to remember that it makes a great deal of difference how the U.S. Army prepares in peacetime, mobilizes for war, fights its first battle, and subsequently adapts to the experiences of

conflict. - In preparing for the future we must exploit the use of Army aviation - supported by air, artillery, and electronic warfare - as the corps commander's principal tools for the deep attack.

The U.S. lags behind in this area, not in concept, but in application. If we fully accept that the future portends victory in the deep battle, then we must address massing those elements of firepower that best accomplish that goal. After all, deep fires are envisaged as the first and most economical means of attack before ground maneuver elements are employed against a softened enemy. In the absence of successfully executed deep fires, a prolonged war of attrition in the close fight may result in mutual slaughter in which the victor can take no solace.

The task organization currently deployed to Saudi Arabia provides some evidence of this mind set. Remarkably as of this writing, there are 10 Apache battalions mustered in Saudi Arabia for massed antitank fires with more battalions enroute. The model proposed later in Chapter 4 merely calls for nine.

### THE HUMAN ELEMENT

Wars are fought by men, not by machines. The human dimension of war will be decisive...The fluid, compartmental nature of war will place a premium on sound leadership, competent and courageous soldiers, and cohesive, well-trained units. The conditions of combat on the next battlefield will be unforgiving of errors and will demand great skill, imagination, and flexibility of leaders.<sup>3</sup>

The importance of the human dimension applies to the third dimension as well. Army aviation can make the difference here between winning and losing by combining the human element with technology. This is particularly true in force-on-force combat where all other factors being relatively equal, Army aviation can tip the balance to provide the margin of victory.

"At a time when the United States has just ended the biggest peacetime buildup of military power in its history, we are told that in the next war we will fight outnumbered and with little, if any, technological superiority."<sup>4</sup> Though far from reassuring, this reaffirms the potential value of the human element and the importance of combining the strength of the human will with technology to overcome imminent force reductions.

It's my view that this society has decided that it will only use a certain fraction of its human effort in its own defense or in preparation for its own defense in peacetime. The imperative just isn't there, we are what we are. We don't have the resolve... so

consequently we have no other alternative but to turn to high technology. That's it.<sup>5</sup>

I believe these are troublesome words considering that many still feel entitled to claim moral victory by virtue of the fact that they own the 'last man standing'. This should raise even more concern that terms for success are consistently measured in this manner at the National Training Center, Fort Irwin, California. It is clear that this is no longer the way to go, if it ever should have been. "Performance at the National Training Center (NTC) measured over several years does not indicate that the U.S. Army can compete successfully with world-class armies."<sup>6</sup> Most battalions at the NTC achieve, at best, parity in the close fight against the opposing forces (OPFOR). However, when the third dimension is introduced, specifically attack helicopters, the battalion task forces fare much better.

Experience at the NTC also indicates that when armored and mechanized task forces are placed in the throes of battle against similarly equipped and tailored Soviet models that only "seventeen battalions out of almost a hundred" have been able to win their battles over a six-year period with the trend remaining constant from 1983 to 1989.<sup>7</sup> These results have occurred despite the efforts of the Army's most successful quality personnel recruiting years implying that the problem is not related to personnel, but is a function of training to employ our technically superior weapons systems at standoff ranges. We simply cannot afford to suffer the type of attrition these results suggest. The doctrine of Airland Battle Future provides the impetus for more economic use of our limited Army resources.

#### AIRLAND BATTLE FUTURE

Airland Battle, first introduced in the 1976 edition of FM 100-1, is an evolutionary product of the 1976 Active Defense.<sup>8</sup> Further revised in 1982 and again in 1986, ALB is based on the tenets of depth, initiative, agility, and the synchronization of all operations. The current derivative, ALB-F, accommodates global political, economic, and social changes while introducing new technology to a more progressively austere force structure which seeks to preserve combat power.<sup>9</sup>

Airland Battle Future attempts to reverse the historical trend that allows technology to drive doctrine. Instead, "the US Army looks to the future with an Airland Battle Future concept intended to guide the development of

doctrine, equipment, organizations, training, leader development, and support."<sup>10</sup> Further, ALB-F provides tactical commanders the opportunity to balance risk in one area in order to mass at the decisive place and time with increased range and lethality of weapons. Commanders at all levels will operate more independently and have more opportunities to apply initiative as well as physical and mental agility. Commanders must accept depth as a given condition on the battlefield, and know that synchronization will become more critically complex.

ALB-F also recognizes that attrition warfare is an increasingly unacceptable approach to combat for the U.S. Army, particularly given world-wide proliferation of state-of-the-art conventional, nuclear and chemical weapons systems. Looking ahead, the ALB-F concept focuses on maneuver in the deep battle and provides the impetus for aviation as a means of decisive maneuver.

Consequently, in a smaller, more lethal and more technologically capable Army, it is imperative that manpower be balanced with the latest technology to deliver the best equipped and combat-ready Army to the field. Army aviation will play a significant role in achieving this balance, and if configured properly for massed fires, it can contribute even more to this combined arms effort.

The ALB-F Umbrella Concept also prepares us for an "Army in Transition" that portends an era of great challenge tempered by austere fiscal policy. Nevertheless, preparations must be continued beyond the year 2000 for new strategically oriented missions based on worldwide land force projection in support of our national interests.

#### THE ROLE OF ARMY AVIATION IN ALB-F

The new AirLand Battle Future Strategic Force imperatives call for tailorable forces, deployability, long range fires, global intelligence, responsive command and control, manpower enhancements, and non-combat capabilities.<sup>12</sup> The trend will be to improve our peacetime deterrent capabilities and preemptive strike capabilities during conflict.

Two ALB-F imperatives are of particular interest for Army aviation: DEPLOYABILITY - "If we can't get there we are irrelevant;" and LONG RANGE FIRES - "The one thing that appears to give us the edge in any regional conflict."<sup>13</sup> Significantly, one entire air cavalry troop can be deployed on a C5

galaxy in the same space required by one M1 Abrams tank. "Our nation's great ability to project combat power, logistically sustain it and then return it safely home, can and probably will make all the difference."<sup>14</sup>

Army aviation, using the external support stores system (ESSS), is a tactical-through-strategic deployable force. Army aviation will also continue to introduce enhanced maneuver weapons platforms for close and long range fires in the form of AH-64 Apaches, the OH-58D advanced scout helicopter improvement program (AHIP), as well as the light attack helicopter (LH). Additionally, these systems will be augmented by older, retrofitted airframes. For this reason, aviation joined by artillery, are two entities that possess the technologies to enhance deep battle, and as a result will comprise a "larger share of the force."<sup>15</sup>

This "larger share" has its genesis as early as September 1978 when General Donn Starry, Training and Doctrine Command (TRADOC) Commander, refocused an on-going study to structure the heavy division of the future - Division 86. This study stressed the tank-killing power of the attack helicopter and established its maneuver role by removing them from the fire support realm. As a maneuver force, Army aviation is the inextricably linked third dimension to AirLand Battle Future. Its role consists of more than the Army version of close air support, and it is a combat multiplier which by its very nature transcends the limitations of linear battle. Further, "Army aviation has the ability to perform maneuver, combat support, and combat service support simultaneously throughout the spectrum of conflict."<sup>16</sup>

Since the 1962 Howze Board and the Aviation Requirements for the Combat Restructuring of the Army (ARCSA III/IV) studies, the Army has continued to mass helicopters under a more streamlined command structure. The recent era of the Army of Excellence and AirLand Battle witnessed even more streamlining, and ultimately, consolidation of attack helicopters at corps level.

In ARCSA III considerable progress was made, but problems still existed in unity of command and span of control because the resulting brigades comprised of 400 personnel and 164 aircraft were too large. Under ARCSA IV (Division 86) the force structure was easier to control and fight as its assigned strength was reduced to 1651 personnel and 137 aircraft. In the Army of Excellence, the pendulum swung towards austerity resulting in units that are presently too resource-constrained. This paucity of combat power has caused

unfulfilled expectations which ALB-F purports to fix by striking a balance between warfighting requirements and resources within the 1990-95 timeframe in preparation for the next century.

Perhaps the next logical step in AirLand Battle Future calls for even further massing of aerial maneuver fires by forming an aviation division. Richard Simpkin prophetically defined airmechanization by stating that autonomous aviation operations meant "a shift of the weight of combat manpower away from the mechanized maneuver as such towards the helicopter element and the artillery."<sup>17</sup> The creation of such a force comprised of a preponderance of aviation, augmented by ground maneuver, combat support, and combat service support units, gives the corps commander the requisite tactical firepower to strike deep, to create penetrations for pursuit and exploitation, and to destroy follow-on forces.

Despite the progress made since Vietnam in aviation force structure toward this capability, we still do not have a unit large enough to mass helicopters to destroy a unit larger than an enemy armored regiment. We are still needlessly and wastefully piecemealing Army aviation into the battle and have yet to take advantage of its massive firepower to accomplish its given mission which is: "To find, to fix, and to destroy any enemy through fire and maneuver."<sup>18</sup>

The mission does not change if an aviation division is adopted, but the challenge then becomes balancing true air maneuver (corps) with ground-paced maneuver (division) in a concentrated employment to destroy the enemy. This results in an accelerated pace of operations aimed at the quick destruction of the enemy whether conducting the attack, defense or counterstroke. "As in all maneuver, the goal should be to secure advantage of position, mass overwhelming strength against enemy weakness, and repeat the process faster than the enemy can react."<sup>19</sup>

As of this writing, the ARCSA V (Corps '96) study is being formed to consider what the options are for Army aviation regarding new unit sets, shifting assets, efficient-effective structure, consolidation, and questions concerning a balanced force mix. A smaller Army, nonlinear warfare, mobility, and mass destruction of the enemy at long ranges are all key topics that the ARCSA V commission will study in concert with the four stages of the ALB-F nonlinear warfighting concept: detection/preparation, establishing conditions for decisive operations, decisive operations, reconstitution.

## CHAPTER 2. THEORY.

Douhet, Fuller, Tukhachevsky, von Senger und Etterlin,  
Simpkin, and Liddell-Hart.

### DOUHET

Giulio Douhet's polemic ideas centered on command of the air which was to be conquered by a powerful and independent air force. In this view, he mistakenly felt the Air Force obviated the need for combined arms action in conjunction with the army and navy.

Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper.<sup>-1</sup>

Obviously not a student of Clausewitz, Douhet also licentiously failed to account for the "fog and friction of war" in the development of his surgical aerial bombardment theories. He also underestimated air defenses and the psychological resiliency of populations in the face of aerial attack. German General Hermann Goerdeler, Iron Cross recipient in both World Wars, saw clearly what Douhet could not: "War is never a technical problem only, and in pursuing technical solutions you neglect the psychological and the political, then the best technical solutions will be worthless."<sup>22</sup>

However, Douhet's idea concerning the exclusivity of the Air Force is analogous to Mahan's naval theory that eliminates the need for sister services. He also shares Mahan's philosophy for the ascendancy of "the capital ship" in his advocacy of the bomber. This relationship can be carried over to the Army's aerial tank, the attack helicopter, as being the "capital ship" of Army aviation. Von Senger und Etterlin similarly saw the attack helicopter, Main Battle Air Vehicle (MBAV),<sup>4</sup> as central to future warfare. For certain, Douhet foresaw correctly the value of combat in the "third dimension" even if he erred in neglecting the inseparable interrelationship among the services - the air arm being only one member of the triad.

### J.F.C. FULLER

The inability of opposing forces in the First World War to achieve decisive battle through speed and maneuver served as the impetus for Fuller's thoughts concerning the mechanized warfare. Fuller expressed the concern that in WWI "armies were so miserably tied down to the pace of the infantry that few mobility possibilities were open to future battle."

"Freedom of movement gives harmony to offensive and defensive power."<sup>25</sup> This is the foundation of Fuller's theory of war which focused on the dynamics of the interrelationship among the combustion engine, tank warfare, and aircraft. His flexible application of the principles of war to changing conditions helped him foresee the possibility of tanks and aircraft within the same organization and serves as a stepping stone for the current thought progression to autonomous aviation units performing the tank and transport role simultaneously.

#### TUKHACHEVSKY

Considered by some as the father of the deep battle, Soviet Field Marshal Mikhail Tukhachevsky spoke of airborne landings in the enemy's rear to disrupt lines of communication, follow-on forces, and industry. His ideas, already taking shape in the 1920s, gave rise to airmechanization theory which was later further articulated by von Senger und Etterlin and Richard Simpson. Tukhachevsky postulated that deep battle excursions had great potential for decisive tactical, as well as operational, destruction of the enemy. The premise of ALB-F strikes at the heart of Tukhachevsky's precepts.

Additionally, FM 100-5 agrees with the Soviet theorist: "...the principal targets of deep operations are the freedom of action of the opposing commander and the coherence and tempo of his operations."<sup>26</sup> The conditions for future battle and the destruction of the enemy's capability to wage further war were central to Tukhachevsky's theory.

Tukhachevsky posited that battles conducted into the depths of the enemy created conditions for a new phase of military art upon which the Soviet operational maneuver group (OMG) concept was founded. Further he surmised that exploiting this concept insures inflicting a decisive and "irreparable defeat" upon the enemy.<sup>28</sup> The formulation of an ALB-F aviation division has an analogous relationship to Tukhachevsky's thinking, and will determine if the US Army has adopted the OMG concept, if not its precise organization.

#### Von Senger und Etterlin

The German General Dr. Ferdinand von Senger und Etterlin introduced the concept of the Main Battle Air Vehicle (MBAV), and felt that the merging of ground and air would become even more pronounced as helicopters achieved the airborne resiliency of tanks. An attack helicopter carrying no infantry live the

HH-64 Apache, was seen by von Senger und Etterlin as the flying equivalent of a light tank; the Mi-24 Hind, with its ability to carry troops, as a flying infantry fighting vehicle (IFV). Thus, he predicted that a resilient air vehicle could take the place of two vehicles, both tanks and armored personnel carriers. He also thought an airmechanized division could be formed as an operational army group reserve.

In keeping with von Senger und Etterlin's views, the future employment of an aviation division is as appropriate in the offense and as it is during the mobile defense as a means of counterstroke. He advises that all modern armies are either mechanized or motorized which implies decremented mobility as compared to, as von Senger und Etterlin points out, the advantages of initiative, agility, and mobility of aviation across the battlefield. In today's terms we would also add versatility and lethality.

Von Senger und Etterlin opines that future armies should not repeat the mistakes of other western nations who in the 1920s and 1930s failed to capitalize on the quantum leaps in combat power of large mechanized formations. He believed that mechanization offered a five-fold increase in mobility, which combined with advances in technology, had substantially increased firepower. Even further advances were achieved by the "application of tactical air power in the direct support of ground operations."<sup>27</sup>

Von Senger und Etterlin points out that superiority in one factor or dimension seldom provides the overwhelming advantage.<sup>29</sup> Decisive success is provided only when superior mobility and firepower are combined for decisive operations. He contended that the air vehicle offered the most possibilities, whereas a vehicle tied to the ground could not match up in the combined arms arena. On the modern battlefield, von Senger und Etterlin warned against even considering tactical operations against a mechanized enemy unless supported by air as a warning to commanders of impending mutual attrition in the close fight.<sup>30</sup>

The US Army was among the first to heed his advice and pursue the development of the attack helicopter. He foresaw that the technology of the day was close to producing far reaching possibilities beyond the capabilities of earlier attack helicopter models even as new prototypes were being developed. He assumed that in the medium-term future an air vehicle would be capable of:

- \* Maximum speed about 300 km/hr
- \* Cruising range about 600 km.
- \* Payload about 2 tons; primarily weapons systems.
- \* Continuous hover capability.
- \* Take-off/landing capability in any terrain.
- \* IFR (near all-weather), very low-level flight and night combat capability.<sup>211</sup>

These data stand up in a striking comparison to the actual capabilities of today's attack helicopters. Von Senger und Etterlin was not too far off the mark as the Apache currently achieves 290 km/hr with a cruise range of 500 km and a payload of 4000 pounds.

His correct analysis of the vulnerability of the airmechanized force, when not on the move or in assembly areas, was tempered by his assessment that dispersion and air defenses would provide an adequate countermeasure to protect the force. Von Senger und Etterlin also predicted that exploration of the third-dimension offered many advantages including a ten-fold increase in deployment speed compared with any land weapon system or formation. Just as the requirement to disperse during the Pentomic Era, he observed that helicopters possessed an unlimited capability to disperse throughout the theater of battle for force protection while maintaining the unique ability to concentrate at a decisive point at the time of choosing. Ferdinand Otto Mikshe referred to this phenomenon in 1942 as "elastic concentration".<sup>215</sup>

Furthermore, great flexibility existed in the choice of weapons attached to the Main Battle Air Vehicle. A combined arms force consisting mainly of MBAs as the major killing system, would be, in von Senger und Etterlin's view, a tactically and logistically autonomous airmechanized force. Like the German "Army Structure 2000", he suggested forming multiple airmechanized divisions grouped together under a higher command for the capability of striking some 200-300 kilometers distance.

He also warned against the temptation to employ airmechanized forces with ground-paced maneuver rather than independently, pointing to the 1930s mistake of tying the tank needlessly to the speed of the infantry. Piecemealing was another pitfall he admonished against when he stated that care should be taken to ensure that these assets are not used in dribs and drabs.<sup>214</sup> Rather, they should be massed to exploit the advantages of airmechanization in a concentrated and combined arms effort.

#### SIMPKIN "The Rotary Wing Revolution"

The ideas of von Senger und Etterlin and Simpkin give substance to the thoughts expressed by the Israeli General Tal, that a flying tank is a real option, but whereas Tal does not believe the helicopter can ever fully replace the tank, the German and the Briton think that it just might.<sup>215</sup> In the major American and European armies the possibility of such an occurrence in the next 25 years is not entirely remote.

"The Falklands War brought out the role of the helicopter as the workhorse of the modern battlefield..."<sup>215</sup> Moreover, while it is performing its mission, aviation can move while dispersed and concentrate to fight in relative safety between engagements. This is a sage technique that both Simpkin and von Senger und Etterlin shared, and is reminiscent of Sun Tzu's adage: "The ultimate in disposing one's forces is to be without ascertainable shape."

The aviation division "with a tempo ten times that of armor"<sup>216</sup> within a 200 kilometer range could deploy, engage and remain on station for just under one hour. Conversely, a tank division over the same distance would take 6-10 hours to complete depending on the terrain. Conceivably, it would then need at least another hour to deploy and bring its artillery into action.

Simpkin observed that the United States used helicopters as flying-tanks based on von Senger und Etterlin's main battle air vehicle concept and credited him with revolutionizing the ultimate weapons-carrying platform that could tactically orient on terrain without utterly relying on it for mobility. As an idea way ahead of its time, von Senger und Etterlin acknowledges, "a main battle air vehicle would have to be a full-performance helicopter"<sup>217</sup> which combines the technology of the 80s and 90s with the thought process of the 60s.

He expressed serious concern over the logistics challenge inherent in a helicopter force comparing the fuel requirements of a helicopter to that of an M1 tank which are in some respects similar. However, the M1 tank is less fuel efficient on the move than it is at idle; whereas, a helicopter is actually more fuel efficient on the move than it is at a stationary hover "when it is running at maximum fuel consumption."<sup>218</sup> If placed at running flight idle, the helicopter could actually have as much battlefield endurance in between refuelings as a turbine-engine tank. When it does need fuel, it can be merely flown to the fuel site and be back "in position within 5 or ten minutes"<sup>219</sup> instead of having fuel brought to it. This is a decided advantage over that of a

tank whose logistics tail must travel well-forward, perhaps in harms way, to service the armor.

Simpkin in 1985 writes of our future warfighting concept: Let us suppose this force of 120 first-line helicopters is to be made up of sixty attack machines (tank equivalent), forty assault machines (infantry fighting vehicle equivalent), and twenty of the fire-support variant carrying multi-barreled rocket launchers. I suggest this is a balanced force because the attack helicopters, with appropriate armament loads, can carry out part of the role of direct support artillery. Let us suppose this brigade would be supported by long-range tube artillery (or naval guns), rocket artillery and fixed-wing air. This brigade's combination of combat worth and strategic mobility is something few have envisaged, let alone experienced.<sup>220</sup>

"Helitroops", which gain their combat worth from momentum, can become a substitute rather than a complement for mechanized forces and be maneuvered about the battlefield synonymously with B.H. Liddell-Hart's indirect approach. Simpkin felt air assault troops and attack helicopters could achieve the same massing effects as mechanized forces while still achieving their simultaneity with the added benefit of preemption.<sup>221</sup>

The ability to preempt is exemplified in Mahan's fleet in being theory which was first attributed to the seventeenth-century British sailor, Admiral Torrington. Mahan states the theory like this: "The presence of a strong force, even though inferior, near the scene of operations will produce a momentous effect on the enemy's action."<sup>222</sup> Its mere presence "is concentration reasonably understood"<sup>223</sup> and will severely limit the enemy's freedom of action in the close battle. Commensurate with Tukhachevsky's thoughts on deep excursions, conditions can then be set for destruction in the enemy's rear. The 'fleet,' or in this case the aviation division, responds to the enemy at the time and place of his choosing to unhinge his force with physical fighting power, superior tactics, momentum and tempo.

This is what Simpkin saw as conclusive evidence of the "rotary wing revolution" because it can exploit terrain for dispersion and concentration in a nonlinear manner without depending on it for mobility. "The rotary wing will tend to turn armies inside out and progressively free them from their parabolic collections of heavy equipment."<sup>224</sup> He further likened helicopter employment to naval warfare on land in terms of preemption and deterrence, and appreciated the value of the helicopter as a means to avoid attrition warfare.

#### LIDDELL-HART

Liddell-Hart would employ airmobility in overhead strokes as a form of indirect approach to link up with mobile tanks and to avoid the 'obstacle' of the opposing army.

To illustrate the point by a board-game analogy, with chess -- air-mobility introduced a knight's move, and tank-mobility a queen's move, into warfare. This analogy does not, of course, express their respective values. For an air force combines the vaulting power of the knight's move with the all-ways flexibility of the queen's move. On the other hand, a mechanized ground force, though it lacked vaulting power, could remain in occupation of the 'square' it gained.<sup>225</sup>

Liddell-Hart's comments on wars of the past lead one to consider the wars of the future, in particular, the current crisis in the Middle East: "Hence no commander should launch a real attack upon the enemy in position until satisfied that such paralysis has developed. It is produced by disorganization, and its moral equivalent, demoralization, of the enemy."<sup>226</sup> Liddell-Hart posited that the soundest strategy in any campaign was to postpone battle and the soundest tactics to postpone attack until the moral dislocation of the enemy renders the delivery of a decisive blow practicable. Similarly, Clausewitz implied that a stationary army consumes itself. This phenomenon of war is currently being exploited by United Nation Forces who have surrounded the Iraqis causing them to squander their physical and psychological energy. During this period of stasis, they are extremely vulnerable to interdiction from the third-dimension.

### CHAPTER 3. HISTORY

Colonel (Retired) James Leach, who served with General Creighton Abrams in World War Two, said in a lecture in September, 1990 at Fort Leavenworth, Kansas: "The birth of rotary wing tactics can be traced to the daring actions of Task Force Abrams at Singling in September, 1944 in the prelude of the Battle of the Bulge."

The advantages and potential of helicopters are readily apparent from historical examples in wars since Korea when in 1951 they were first listed as a "critical item"<sup>31</sup>. Today's technological advances in weaponry and survivability, coupled with skilled combat crews, provide for a very formidable weapons system.

#### HISTORICAL OVERVIEW OF THE HELICOPTER IN WAR

##### From Korea to the 1962 Howze Board

Before World War II, the Army had taken an interest in the development of rotary-wing aircraft, but it was not until the Korean War that helicopters came

into common use for combat support. By the end of the war some of the helicopters carried payloads of up to 1800 pounds and 10 passengers. Their mobility on the battlefield reduced the soldier mortality rate by establishing a "golden period" of six hours from the time of a wound to medical treatment. Americans in Vietnam used helicopters to get casualties away from the fighting with astonishing speed as did the Israelis in Lebanon, "preventing deaths which would have almost certainly have occurred in any previous war."<sup>32</sup>

The uses of the helicopter for front-line logistics resupply, medical evacuation and, most importantly, air assault tactics in support of the Marine Corps by twelve helicopter battalions were early indices of spectacular future for rotary wing aircraft. This is especially true following the advent of turbine engines which vaulted the potential of the helicopter exponentially. Korea, as their first major test, created great hopes for their enthusiasts in the Army. This set the stage for the employment of great numbers of scout, attack, medical evacuation, and heavy lift helicopters which opened the way to an altogether new style of combat. Of early concern, was the Air Force's view that the employment of the helicopter as a weapons platform in close air support impinged upon its roles and missions.<sup>33</sup> However, Army aviation's role in troop and logistical transportation was seen as less threatening and, therefore, a less volatile issue.

General James Gavin, Army DCSOPS, was a primary proponent for an expanded role for the helicopter in 1955. Gavin expressed enthusiasm for helicopters as a combat vehicle for rapid concentration and dispersion on the battlefield. He was successful in establishing the position of Director of Army Aviation and named Brigadier General Hamilton Howze as its first director. BG Howze was able to convince the Army Staff, despite President Dwight Eisenhower's austere "New Look" budget, that airmobility was in concert with the overall Army Concept.

General Howze, as director of Army Aviation from 1955 to 1958, promoted airmobility through a series of tests at the Command and General Staff College (CGSC) in which an air cavalry brigade was substituted for a U.S. armored division. It was given the mission of delaying the advance of three Soviet divisions in West Germany, and surprisingly, the highly mobile air cavalry brigade did a better job of holding off the Russians. As for the utility of

heliborne forces in smaller wars, airmobile enthusiasts also contended that because of their superior mobility, they could apply firepower better than standard divisions.

The helicopter offered the Army a means of increasing its air support while, at the same time, exerting pressure on the Air Force to enhance its ground support capabilities or risk losing out to the Army both the mission and the budget allocation. "Yet despite the growing enthusiasm for airmobility in some Army quarters, the only unit that attempted a significant structural change during this period was the 101st Combat Aviation Battalion (Provisional), [101st Airborne Division], the first such organization in the Army."<sup>34</sup> Ironically, the division commander at the time was Major General William C. Westmoreland, who would later be responsible for all forces in Vietnam.

The Army's enduring dissatisfaction with Air Force close air support was also a factor aiding the cause of airmobility. The Army, in effect, created its own air force which could provide both close air support and airmobility. The 1960's witnessed rapid growth when the Army replaced the 1950s initial aviation inventory which originally comprised only 688 light airplanes and 57 helicopters. By 1960 the Army had acquired over 5000 aircraft of fifteen different varieties, and had become the acknowledged leader over the Air Force in rotary wing assets. During this time, the Air Force was uneasily watching its relative share of the budget dwindle and found itself described in front of a Congressional committee as the "silent silo sitters of the seventies"<sup>35</sup> as missile technology had become an increasingly important part of the Air Force structure.

#### **Prelude to Vietnam: Eisenhower-McNamara-Kennedy**

Ostensibly rejected as too expensive under the Eisenhower administration, airmobility was resurrected as a useful tool in the transition from the policy of massive retaliation to one of flexible response in the Kennedy administration. The first doctrine for Army aviation was geared toward the conventional and nuclear battlefield of Europe, not for counterinsurgency operations in Vietnam<sup>36</sup> as many seem to incorrectly recall.

Secretary of Defense Robert McNamara's interest in airmobility in September 1961 was aroused following a review of the Army's aviation

procurement plans which he decided were strung out over too long a period. He decided that if helicopters were necessary for the transition to future war, then the procurement process should be accelerated and be paralleled by a new force structure to take advantage of their inherent flexibility.

Although airmobility concepts were not deliberately designed for limited war situations, their advantages for counterinsurgency operations were obvious as indicated by the Stillwell Report submitted in 1961.<sup>37</sup> The purpose of the Stillwell Report was to determine and prioritize roles and responsibilities for Army aviation in paramilitary and psychological operations, offensive and defensive operations in war, and in actions short of war.

The Howze Board gave further impetus to the airmobility concept when its report reflected the potential utility of helicopters in future war. Supported by Secretary McNamara, the board recommended that the Army's force structure be modified to substantially increase the procurement of UH-1 helicopters.

Immediately following the board's findings to develop airmobility further, Secretary McNamara directed the Army to explore the issues. General Howze, Commander of STRAC and the XVIII Airborne Corps, was appointed president of the ad hoc U.S. Army Tactical Mobility Requirements Board and given instructions to reexamine the Army's role in aviation and corresponding aircraft requirements. The Howze Board ultimately recommended that the airmobility concept be developed through the formulation of the 11th Air Assault Division.

General Harry W.O. Kinnard, who commanded both the 11th Air Assault Division, and later the 1st Cavalry Division, understood clearly that the success of the airmobility concept relied on its application across the full operational continuum and not just in the counterinsurgency role. The concept along with tactics, techniques, and procedures were further developed in Vietnam by the Army Concept Team (ACTIV) under the auspices of the Howze board, while commensurate efforts occurred at Fort Benning to activate the 11th Air Assault Division in February 1964. Both tests indicated that ...advantages of increased mobility and maneuverability inherent to the air assault division offers a potential combat effectiveness differential that can be decisive in tactical operations.<sup>38</sup> As a result of the tests conducted at

Fort Benning, it was also recommended that an air assault division be included in the Army's force structure. This recommendation, cascaded by the efforts of an influential minority to apply technology to the nuclear battlefield in Europe and abetted by interservice rivalry with the Air Force, ultimately led to the organization of the 1st Air Cavalry Division.

Ironically, as the situation worsened in Vietnam, the Army still had not prepared itself overall for full-scale deployment and mobilization in response to the crisis. As a result, the 1st Air Cavalry Division was the first major combat unit sent to Vietnam as the Army distorted its original concept to meet the exigent counterinsurgency crisis.

### VIETNAM

Our clearest thoughts about successful combat organizations are the result of our experience in Vietnam, where the combined use of helicopters and armored forces was overwhelmingly powerful.<sup>310</sup>

The helicopter idea certainly had much to recommend it, and it is extremely doubtful that the war could have been fought at all without it.<sup>310</sup>

#### Background of the Airmobile Concept

Airmobile warfare was developed in the 1950s as a possible solution for U.S. Army survival on the nuclear battlefield. The primary modification to the Army's force structure in the period before the commitment of combat units to South Vietnam was the formation of an airmobile division as the answer to counter the mobility of Viet Cong guerrilla units. Although the airmobile division was originally designed to provide rapid concentration and dispersion on the nuclear battlefield, it was instead employed to the jungles of Vietnam. Remarkably, the same argument for rapid and concentrated actions is used just as effectively today as ALB-F issues take shape.<sup>311</sup>

Politically, airmobile forces had to be adapted to the European environment, not to low-intensity conflict although traditional counterinsurgency doctrine calls for light and mobile forces. After intensive studying and testing at Fort Benning, Secretary McNamara activated the 1st Cavalry Division (Airmobile) in June 1965.

Known as the "First Team" and the "high tech division of the 60s",<sup>312</sup> its 16,000 men, organic artillery, and ground vehicles were to be flown into battle by some 435 huge Chinook and Iroquois helicopters. Six twin-engine Grumman OV-10B Howlers with infrared scanning devices were to be used for

reconnaissance. Four giant "flying cranes" that could lift an airplane, carry enough subsistence rations to feed a battalion for three days, and haul heavy artillery guns with crews and ammunition, were also committed as part of the team. Although lightly armed and lacking staying power in battle, the division's greatest assets were its ability to cover all types of terrain, to maneuver over large areas, to react quickly to enemy attacks, to reinforce units in contact, and to conduct raids behind enemy lines. The division commander, General Kinnard, boasted that "The airmobile concept gives a commander a degree of surprise, freedom of action, and speed never before possible to ground combat."<sup>313</sup>

The deployment from Fort Benning to An Khe proceeded rapidly and relatively smoothly. The 435 helicopters were flown into a 3000 by 4000 foot clearing which had been hacked out of the jungle with machetes and 'paved' with an oil-based solution to keep the dust down. It is from this location that the 1st Cavalry Division would conduct a "classic exploitation and pursuit mission"<sup>314</sup> in the first major battle of Vietnam between a US division and three North Vietnamese Army regiments during the period 18 October to 24 November 1965.

Now among the elite of the Army, many of its officers and key enlisted personnel had been hand picked. The unit assumed the black and gold horse head insignia of the prestigious and tradition-laden 1st Cavalry. Kinnard, whose personal elan epitomized the style of the unit, was also its brain-child to a considerable degree. "A colorful and crusty Texan with a distinguishable World War II combat record, he sometimes wore a black eye-patch emblazoned with the 'Cav' insignia."<sup>315</sup> Again despite its original purpose, the 1st Cavalry performed as if it had been designed explicitly for Vietnam. It was also the first integral division to deploy intact to Vietnam, to engage the enemy in battle and to employ helicopters in an attack role.

#### 1A DRANG CAMPAIGN 1965

The 1st Cavalry Division's victory in the Ia Drang Valley, which resulted in 6000 North Vietnamese killed and the decimation of three North Vietnamese Regiments, is an anomaly considering the traditional outcomes of America's first battles. In the battle of the Valley of Death, essentially two well trained and equipped division-sized elements were pitted against each other resulting in several lessons learned. First, that massed US helicopters

delivering overwhelming mobility and firepower resulted in a tactical and operational advantage that could not be matched by the opposing force. Secondly, when US casualties did occur, aerial medical evacuation saved many American lives. Thirdly, on the return trips timely resupply missions to sustain the fight set a precedent never before achieved.

22 November 1965, columnist Joseph Alsop also noted that the Ia Drang was exceptional among first battles of American wars: "In contrast to Bull Run and Kasserine Pass, he pointed out, green American troops had taken on an enemy with seven-to-one numerical superiority and had won remarkable victories on the enemy's chosen terrain."<sup>316</sup> General Westmoreland labeled Ia Drang as an unprecedented victory, and President Johnson awarded the 1st Cavalry a unit citation for its exploits in the battle. Captured documents in the aftermath of Ia Drang indicated extreme North Vietnamese concern regarding the importance of American firepower and the devastating effects it had on their efforts to match the Americans conventionally. General Kinnard agreed with Army officials who found in this first battle validation of existing equipment, doctrine, and tactics as well as the cornerstone for the continuing doctrinal and employment revolution of Army aviation.

#### LEBANON 1982: "Operation Peace for Galilee"

More recently Vietnam lessons, refined and adapted to desert warfare, were evident in the 1967 and 1973 Arab-Israeli Wars. The Israelis imitated U.S. airmobile tactics with great success against the Egyptians and Syrians, by employing helicopter battalions behind the lines to attack armored vehicles and undefended artillery outposts and to position paratroopers.<sup>317</sup>

The importance of the Israeli Air Force was clearly established through the employment of better tactics and more sophisticated helicopters in June 1982 during Operation Peace for Galilee. The strategic objectives of the Lebanon war presented Israel with several tactical challenges requiring the employment of the latest technology and tactics in fixed and rotary wing aircraft. "The Israeli Defense Force (IDF) was able to achieve all major objectives with minimal losses in personnel and equipment, and many valuable lessons were learned."<sup>318</sup>

Classed helicopter assault fires in the close air support anti-air defense artillery (ADA), aerial artillery, and air-to-air roles enabled the IDF to

quickly penetrate Lebanon and surround the PLO in Beirut. This highly synchronized operation forced the hasty evacuation of the PLO to other safe havens outside Lebanon.

Unlike the U.S. Army, all Israeli aircraft fall under the Israeli Air Force (IAF). "Following the 1973 Mideast War, the Israeli Air Force looked for a way to stem the tide of rapidly moving armor assaults during mobilization. The Israelis turned to attack helicopters to fill this gap in their defense."<sup>319</sup> Israeli attack helicopters were extremely successful in targeting air defense systems, command and control (C<sup>2</sup>), and specialty vehicles such as bridging (AVLB) and logistics vehicles. Tanks/infantry fighting vehicles were engaged using TOW missiles and 20mm cannon fire. Success was achieved despite the hindrances of the high threat and harsh environment where high temperatures and density altitudes limited aerodynamic performance. The same harsh conditions, particularly exacerbating during the summer months, exist for our helicopter forces in Saudi Arabia today. Although not debilitating, these climatic conditions also degrade forward looking infrared sighting devices which rely on surface temperature differential for a clear picture.

Just as in Vietnam, and still applicable to today though slightly less so, the threat most feared by the pilots were small arms fire, ADA gun systems, and main tank gun rounds. "The two admitted losses of Israeli helicopters were due to tank maingun rounds (armored piercing fin stabilized discarding sabot (APDS))."<sup>320</sup>

Assault helicopters also played an important role in the overall accomplishments of the IAF by supporting the initial assault with helicopter insertion of tank killer teams to bypass enemy strongpoints and urban defenses and to construct blocking positions in support of the ground maneuver. CH-53s conducted resupply of ammunition to the advancing artillery, infantry, and tank columns which ensured the momentum of the attack. Like their American counterparts, the Israelis support well forward with forward arming and refueling points (FARPs) and maintenance support teams to sustain the effort.

The overall accomplishments of Israeli's helicopters in the 1982 Lebanon War far exceeded their limited number on the battlefield. Military commanders such as Israeli General Dolev reported a high degree of success, suggesting that fully 60 percent of the tanks and thin-skinned vehicles killed in the war were killed by helicopter gunships.<sup>321</sup>

Some of the lessons learned centered around the lack of real-time intelligence despite the availability of highly sophisticated collection systems, and the difficulty in rapidly adapting to new doctrine under fire. The Israelis found their attack helicopters (all American manufactured) to be a formidable weapon and far more lethal than expected largely due to standoff range capability and extremely accurate target acquisition systems. Reduced exposure time and repositioning to alternate locations after an engagement were essential to counter the constant small arms threat even at terrain flight altitudes. Further, new targeting systems and ammunition capabilities made the tank a formidable direct fire opponent to helicopters.

It was also learned that new technologies give greater flexibility to the attacker, but must be supported by initiative and imagination, seen as essential leadership elements. Among the most successful new weapons were American-made Bell Cobra and the Hughes 500 MD Defender helicopter gunships. The Cobra had seen action in the Iran-Iraq wars as a tank killer, but Lebanon was the first time the Cobras were flown in a sophisticated manner by well trained military crews in the antitank role. "Other sources note that they killed twenty tanks and fifty thin-skinned vehicles--there is no doubt that the Cobra and Hughes helicopters did an excellent job."<sup>322</sup>

Caution however, must be observed so that we do not compare U.S. doctrine too closely to Israeli combat experience. "The IDF spent a great deal of time and resources conducting a lightning-fast preemptive strike that is imperative to the strategic defense of their nation."<sup>323</sup> In light of our current situation, it would be nice if we could muster in a like manner the helicopter firepower necessary to conduct such a maneuver against present Iraqi positions, if not preemptively, then at the first sign of their offensive posturing. Our national policy radically differs from that of the Israeli government on this issue, and under normal circumstances, precludes us from conducting such a preemptive maneuver or initiating offensive operations except under in extremis conditions.

This does mean that we have limited capability as the technology, the numbers of helicopters, and the doctrine are all currently on hand to conduct such a preemptive attack on massed Iraqi armor and mechanized forces should the United States wish to achieve quick and decisive tactical victories. This

could also be accomplished with minimal loss of life and expenditure of resources by conducting deep fires from standoff ranges.

### IRAN-IRAQ

During its eight-year war with Iran, Iraq never really decided on the coordinated interface between artillery, attack helicopters, and fighters. Consequently, Iraq never demonstrated that it could mass its air strength against key strategic targets long enough and consistently enough to have an adequate effect. Iran did achieve some success interdicting Iraq's oil flow by conducting helicopter strikes against Iraqi facilities in the southern gulf.

Because of Iraq's failure to mass its attack and assault helicopter forces, its attacks resulted in desultory piecemealed efforts and "by the 3rd of July, Iraq was forced to admit that Iran had liberated Meheran."<sup>324</sup> In recapturing Meheran during the Kerbala I attack, the Iranians took advantage of the Iraqis whom they had surrounded on three sides. Additionally, Iraqi C<sup>2</sup> problems inhibited the full capabilities of its Soviet modeled air forces despite a decided advantage over Iran's poorly supplied AH-1 Cobra gunship fleet. The command to provide full scale, coordinated air support came far too late in this operation which resulted in the Iraqis flying only "33 helicopter sorties during the critical phase of the Iranian assault, versus a capacity of over 500."<sup>325</sup>

## CHAPTER 4. MODELS FOR THE AVIATION DIVISION CONCEPT DEVELOPMENT

It is time for the Army to take a hard look at the validity of these cornerstones in light of AirLand Battle doctrine.<sup>41</sup>

### Overview

Current Army division designs have roots back to the 1962 Reorganization Objective Army Divisions (ROAD) concept of multiple division designs which were made up of an amalgam of combined arms and support elements. This basic structure has not been radically challenged in any new force design effort since 1962, including Division and Corps '86, and the Army of Excellence.

Following Vietnam, the Army began to refocus on conventional operations in NATO. Helicopter operations in Vietnam, combined with observations of the lethal 1973 Middle East war, served as the catalyst for new initiatives in force structure which resulted in the triple capability (TRICAP) division

experiment, which fused armor, airmobile infantry, and air cavalry which included attack helicopters. "This was the first major attempt to fully integrate helicopter capabilities into a tactical formation designed for the NATO battlefield."<sup>42</sup>

Although the TRICAP experiment did not survive, the basic notion of combining ground and helicopter forces in a divisional structure did. In fact, the Division '86 design included a fourth maneuver brigade which provided Army aviation forces for each division. This concept was derived from lessons gleaned from Korean and Vietnam War experiences and now serves as a stepping stone to the formation of the aviation division.

However, the ALB-F evolution even further consolidates aviation assets. As a result, maneuver brigades are constrained to operate without organic aviation, light divisions will be limited to air assault and general support aviation only, while heavy divisions will have organic light attack (AH-56/LH) and reconnaissance helicopters. At corps level, attack assets (AH-64/AH-56/LH) will be consolidated and have enough organic air assault assets to lift a light, airborne, or air assault brigade. Echelons above corps will provide theater medium and heavy lift units.

#### The Current Corps Aviation Brigade Model.

Figure 1 depicts the corps aviation brigade which is presently organized and equipped to achieve success through the employment of AirLand Battle doctrine which stresses the three-dimensional nature of modern warfare. The aviation brigade is ideally suited for exercising the ALB tenets of initiative, agility, depth, and synchronization.

The mission of the aviation brigade is to "find, fix, and destroy the enemy through fire and maneuver."<sup>43</sup> Operating in its CS and CSS roles, the aviation brigade additionally has the missions of providing integrated support as well as command and control over internal aviation assets and to the combined arms team. The brigade headquarters has limited planning assets to conduct multiple missions in combat in aviation pure or combined arms operations.

Additionally, the corps aviation brigade has "unique maneuver capabilities: these enable the corps commander to focus mainly on high-tempo aviation operations."<sup>44</sup> This also gives the corps commander the ability to shift the

balance of combat power to his advantage by exploiting the third-dimension using attack, assault, reconnaissance, and medium lift helicopters.

#### Precedents For An Army Aviation Division.

There are four specific precedents to the current proposal for an Army aviation division that I will address. The first is the 1st Cavalry Division which was addressed historically in the previous chapter. The other three comprise the presently existing French 4th Airmobile Division; two proposed airmobile divisions under the "German Army 2000" concept; and the Ninth Cavalry Brigade located at Fort Lewis, Washington. Lastly, I will propose an ALB-F compatible model for an aviation division that masses the killing systems for deep attack.

Two western nations, France and Germany, have already incorporated division-sized aviation units into their current or proposed Army aviation force structure. One only need observe the mutual and catastrophic losses incurred by both sides in the Arab-Israeli and Iran-Iraq Wars to understand that the ground war in the close fight invites exploration for alternatives in the deep battle to help preclude needless loss of life and materiel. These models are presented as alternatives to take the fight deep.

#### The 4th Airmobile Division (French)

France has already successfully implemented its unique concept of a completely independent, integral airmobile division. Figure 2 depicts the French 4th Airmobile Division (DAM) which is a balanced and self-supporting unit organized with complementary and flexibly tailored regiments to ensure a high state of readiness.

Known as the "French Fire Brigade", the 4th DAM evolved experimentally and is the most modern of the five divisions in the Force Action Rapide (French Rapid Deployment Force). Designed to operate at depths of 30-100 kilometers, it is the only unit able to engage an enemy at helicopter speed. Uniquely, it is tailored to operate alone, but can be employed in combined arms actions as well. The French organization comprises three helicopter regiments, a command and maneuver helicopter regiment, an airmobile combat regiment, and an airmobile support regiment, providing a balanced force for totally independent operations.

The airmobile division, which will consist of 240 helicopters and 6500 men in wartime, was recently tested and validated in exercise Damoiseau 89. Day and night exercises with night vision goggles (NVGs) were performed to 100 kilometers depth against enemy forces. Many techniques originally developed by U.S. Special Operations helicopters (Task Force 160) were also performed by the 4th DAM. In addition to NVG low-level flight, discrete blue-green and infrared formation lights were used to perform close tactical formations to positions across the forward line of own troops (FLOT) where the enemy could be engaged at close quarters. State-of-the-art secure communications were also employed via Reseau Integre Transmissions (RITA - forward communications network). "This system in service since 1980, has voice, teleprinter, and data burst capability."<sup>45</sup>

Good command, control and communications and intelligence (C<sup>3</sup>I) at all times is considered as absolutely critical to the French as it is to us. The battle is controlled by divisional and regimental commanders operating both on the ground and in the air from their specially equipped airborne CP Pumas. The regiments, when ready to engage the enemy, traverse the battlefield at nap-of-the-earth speeds and altitudes in radio silence to sites about 30-100 kms behind the FLOT. Particularly noteworthy, all three helicopter regiments are employed simultaneously en masse.

For reconnaissance, each regiment has 10 Gazelles equipped with an Atmos observation sight. Divisional intelligence is also provided by the 1st Infantry Combat Regiment using a light reconnaissance company comprised of 96 motorcyclists who conceal themselves and pass information by radio. Exercising some control of ground personnel, the 4th DAM also employs three scout antitank companies equipped with 16 Milan teams, a command and service company, an airmobile strike company (infantry), and a company of light engineers for mining and counter mobility which is air deployed by the command and maneuver company consisting of 50 Pumas.

To sustain itself, each regiment during this particular exercise deployed with 12 rubber 1,050 liter fuel tanks which are externally carried by Pumas to dispersed FARP locations. Each crew was trained to conduct refueling and rearming without the use of additional personnel. At regimental level, four Gazelles could be refueled simultaneously within ten minutes, while HOT wire-guided ATGM missiles were reloaded in seconds. At divisional level, up to

ten helicopters could be serviced in larger FARPs from rubber olivets which were widely used in operations in Chad. Air defense in the FARP was provided by 20 mm guns and Mistral, and manned by the 1st Infantry Combat Regiment.

In close proximity to the enemy, the French use tactics similar to ours. Low-level and nap-of-the-earth (NOE) profiles are employed to get within range of the target while overwatching positions cover the engaging helicopters. Once an aircraft has fired its ordnance, normally at ranges of 2500-4000 meters, it repositions to an alternate location having compromised the first, or it returns to the FARP to prepare for follow-on missions.

French simulations indicate enemy armored vehicle losses to be between 10:1 and 12:1 to friendly helicopters depending on the circumstances. In this exercise, umpires assessed 150 enemy vehicles killed to 15 French helicopters. These results closely approximate our enemy-to-friendly kill ratios as indicated by "First Battle", Combined Arms Center computer simulations, and RUC results which vary from 7:1 to 14:1 ratios in favor of friendly systems.

In the Iran-Iraq War, the French have determined that the Giat 20 mm cannon-armed Gazelle fared well against the U.S. built AH-1 Cobra flown by the Iranians. They have also been satisfied with its performance in Chad.

#### German Army Structure 2000

Not unlike similar realities currently facing the United States, Germany is challenged with maintaining warfighting capability while it is "substantially influenced by a declining manpower supply and by fiscal constraints."<sup>46</sup> At the core of its policy for the future is the recognition that "the linking of command and control, reconnaissance, and fire, with high-speed communication, combined with an increased range of weapons and their improved target effectiveness will permit us to bring our resources to bear distinctively more effectively than today."<sup>47</sup>

Of twelve divisions that will continue to exist, two will consist of airborne divisions under the Federal Armed Forces "German Army Structure 2000" concept which is displayed in Figure 3. Each division will contain, in addition to the transport helicopters of the corps, one antiarmor helicopter brigade and one airborne brigade. The airborne brigades are to have two paratroop battalions each. The parachutists perform as helicopter air assault troops in addition to airborne operations.

The antiarmor helicopter brigades within the airmobile divisions will be converted from the present antiarmor helicopter regiments and will integrate antiarmor helicopters, escort and protection helicopters, and liaison and observation helicopters into a composite operation at brigade level. Each brigade has the responsibility to provide divisional command and control, reconnaissance, and combat missions.

Similar to U.S. ALB-F deep battle tactics, the Germans plan to employ across the FLOT in support of their airmobile division's remotely piloted vehicles (UAV), deep artillery fires with radar and optronically located target acquisition, and EW to complement their heliborne deep attack. In addition to the deep attack role, these forces will be used to "improve the operational reserves of the corps."<sup>48</sup>

The German deep attack mission will be led by aviation assets and be supplemented by armored and mechanized forces with product-improved or eventually replaced LEOPARD 2s, MARDERS (IFV), and an antiarmor-antihelicopter armored gun system (PANTHER) with a mounted rocket system ranging 12-15 kilometers. All German Army helicopters are also undergoing a two-stage product improvement featuring state-of-the-art avionics, visionics, night vision devices, and the STINGER air-to-air missile system.

While the German situation is characterized as an endeavor to achieve mission readiness with insufficient resources, they appear to be determined to deal with the future with measures to increase their combat effectiveness despite reductions in overall end-strength. Economizing with combined arms units such as their proposed airmobile divisions, which can be tailored to accomplish the mission, appears to be a viable part of their solution. "The creation of the capability for deep battle (emphasis in the original) and use of the 3rd dimension (emphasis in the original) in a new quality are clear signs of the gradual change to being able to meet the tasks of the future."<sup>49</sup>

#### Proposed Army Aviation Division Model

The execution of air maneuver under the ALB-F Umbrella Concept,<sup>410</sup> clearly calls for a truly unique organization -- one that combines an innovative aviation design structure accompanied by an airmobile, highly maneuverable and lethal ground force. The aviation division envisions aerial maneuver in the

deep attack as a natural outgrowth of AirLand Battle Future and ties emerging doctrine with technology to produce a capability that for now threat forces cannot replicate.

Although the idea is not new and has its origins in the 1930s as theorized by von Senger und Etterlin, its implementation remains a radical issue. However, as cited above, precedents have already been established in Vietnam, Europe, and to a limited degree, in the 9th Infantry Division. These are all examples of efforts to pool those resources best suited to fight the deep battle at the division and corps tactical level.

Figure 4 depicts an example of how Army aviation might be structured. It is a six-brigade organization composed of two attack helicopter brigades, one assault helicopter brigade, one general support helicopter brigade, an artillery brigade, and an armored gun system (AGS) brigade. It also has organic combat support and combat service support units for autonomous self-sustained operations.

This proposed aviation division is designed to be employed by corps, or in concert with the main effort division. More significantly, it can be fought as an autonomous unit, by brigades, or as part of a combined arms team depending on what the mission dictates. If the intent is to fight aviation as an integral unit against a massed armored target, then the employment of the entire aviation division may be the way to go. For an aviation division to be successful, all of its aircraft must be used to execute the corps deep battle mission. The implication here is that the corps would still need an aviation brigade for its close battle C<sup>2</sup>, combat, combat support, and combat service support needs. Additionally, the unit must be staffed to prosecute the close fight for execution and planning of contingencies (branches), as well as staffed for the deep fight and for setting the conditions of future battle (sequels).<sup>411</sup>

## CHAPTER 5. FUTURE DIVISION AVIATION BATTLE SCENARIO

### Overview

All real-world U.S. contingency operations across the operational continuum envisage the employment of helicopters in decisive or major support roles. As the Army down-sizes, the Army must explore the means to achieve with helicopters the advantage it once enjoyed with ground troop concentrations. The Army can no longer achieve effectively the principle of

mass as it once knew it unless it evolves on a new path. All recent historical examples of warfare bear out this assertion and set the conditions for future use of rotary wing aircraft.

To train for worst-case conditions, the Southwest Asia and Combined Forces Europe scenarios have become "standard" TRADOC vehicles for future linear and nonlinear combat developments. The Southwest Asia theater is particularly volatile at present and for this reason. I have selected it as the vehicle to demonstrate the present and future viability of aviation massed fires in the deep attack. (See Figures 6 and 7).

In the SWA scenario, the corps must deny the enemy the ability to concentrate combat power by attacking his follow-on forces in depth. The deep operations concept has as its basis the operational triad of maneuver, fires, and command, control and communications counter measures (C3CM). "Our deep fire systems are superior to the threat and are very effective while direct fires favor the threat forces either in a slight technological or a massive numerical edge."<sup>51</sup> As a result, a direct fire attrition fight in the close battle in the absence of deep fires favors the enemy. However, deep fires, particularly helicopters, are not only extremely effective, but allow the corps commander to set the future conditions for maneuver.

In the battle, a number of combat multipliers will be combined for a synergistic effect. First, attack helicopters will fight a long-range battle in concert with Air Force fixed-wing BAI, EW, and JSEAD. This combined effort will be augmented by RISTA (reconnaissance, intelligence, surveillance, and target acquisition) assets, the Army Tactical Missile System (ATCMS), and be augmented by corps electronic warfare (EW), TACIT RAINBOW and Lance. Additionally, division aviation could conceivably be supplemented by corps deception planning, UAV video, and electronic surveillance. The attack will commence only after air superiority is achieved.

#### The 47th Air Assault Division (Notional) in the Deep Attack.

In this situation, as depicted in Figures 5 and 6, the 47th Air Assault faces two corps. The first corps, is located in the northeast and the second corps has moved out to the west. It has deposited three brigades of infantry at the junction of the neutral zone between Kuwait and Saudi Arabia. The deployment phase preceded D-day by 25 days. On D-day two significant events have

occurred. The first Iraqi corps attacked into Kuwait. The second corps minus the infantry brigade with three tank divisions attacked across the boundary and seized the Raha pipeline that runs to Jordan. On D-day, the expectation is that the corps can close from Raha to Al Batin by D+5, but friendly intelligence and electronic warfare (IEW) assets have tracked their movement which compromised the enemy plan.

Before the evening twilight turns to darkness, the G2 has already identified an important and lucrative target whose destruction through aerial maneuver "could unninge the enemy force and clearly shift the momentum."<sup>52</sup> The intelligence preparation of the battlefield (IPB) has produced IEW and target collection data which has been augmented by national strategic intelligence assets (ie, JSTARS). The G2 also taps organic capabilities to influence EW and intelligence collection to include include AH-64 mounted jammers, AHIP, Quickfix, Guardrail, OV-1D SLAR. Guardrail has data links to TACFIRE and the Tactical Commanders' Terminal (TCT) which provides near real-time (NRT) intelligence to the ground commander's targeting cell.

In the hours of darkness within an extremely limited window of opportunity, the attack commences with battlefield air interdiction (BAI), close air support (CAS), multiple rocket systems (MRLS) delivering suppression, and localized electronic warfare systems to destroy, neutralize and suppress enemy air defenses and C<sup>3</sup>. "Within minutes following the JSEAD (Joint suppression of enemy air defense) mission the attack begins with artillery preceding each leg of the flight and into the enemy positions as the attack helicopters arrive on station."<sup>53</sup>

The 47th Air Assault Division attacks as early as possible the 2d Iraqi Corps at Raha with three Apache brigades augmented by an Armored Gun System (AGS) brigade. The AGS brigade, equipped with future scout vehicles to complement its armored guns, will also be deployed at night in a follow-and-support role, and gives the aviation division commander the capability to secure terrain as objectives are achieved.

Control of terrain is also accomplished by inserting troops and weapons deep in the enemy rear to link up later, or by moving them swiftly to fix or contain enemy penetrations and to designate targets. Self-propelled artillery is brought forward while the towed artillery is flown in beneath CH-47

Chinooks and UH-60 Blackhawks. Controlling all this activity from the air is the commander in a UH-60 command console equipped Blackhawk.

Against a force of three tank divisions, five elements of force are employed simultaneously -- air force, attack helicopters, ground maneuver forces, long range artillery systems, and intelligence and electronic warfare systems. The attack is conducted when the enemy least expects it by reaching out to the maximum depths of our organic systems.

The actual attack, conducted at night, has each AH-64 carrying a standard load configuration which includes: 2,200 pounds of fuel, eight HELLFIRE missiles, 38 2.75-inch FFARs (folding fin improved Hydra 70 aerial rockets) and 1,200 rounds of 30mm chain gun ammunition. The number of HELLFIREs can be doubled to 16 by omitting the Hydra 70 rockets. Likewise, the number of rockets can be doubled by omitting the HELLFIREs. Follow-on Apaches and AHIPs will also carry 2 STINGER air-to-air missiles per aircraft. All of this can be pushed across the FLOT out to 130 kilometers deep and still remain 20 minutes on station before returning. At a distance of 100 kilometers, the aircraft can stay on station 40 minutes in the attack. An operation out to a distance of 200 kilometers is possible if FARPS are pushed out halfway using HMMETS, UH-60s, and Chinooks.

How deep and within what bounds is it viable to commit Army aviation during deep attack? The attack can be as deep as organic tires and logistics will allow. The risk assessment must be prudently balanced depending on enemy strengths and disposition. Obviously, the deeper the attack the more assets that must be pushed across the FLOT and for a longer period. It is possible that aviation division could attack up to 200 kilometers, possibly over a two day period if adequately resourced.

The whole nature of the Air Division mission is to take the enemy apart in time and in distance. But to achieve success of this mission - which could be an attack, exploitation, raid or pursuit - the corps commander must establish priority of tires and combat service support to the attack above all other activities.

The criticality of this mission centers on the aviation division's own organic capability to deliver logistics at the appropriate time and place during the course of this complicated battle. The CSS environment is austere and

units must carry as much Classes III and V supplies as possible, using captured enemy stocks when available and doing without where necessary until linkups can be effected. Corps, the lynchpin for logistical support, must place as far forward as possible especially tailored LOGPACS to ensure success. As rapidly as intermediate objectives are secured, CSS elements must continue to pour in support for the fight until the objective is secured or until exploitation forces arrive to prevent encirclement and block enemy reserves.

## CHAPTER 6. ANALYSIS AND EVALUATION

General Crosbie Saint: The Integration of deep battle is essential to the big win.<sup>61</sup>

### Overview

According to Clausewitz (Jomini would agree), the first principle of strategy is to ensure that as many troops as possible should be brought into the engagement at the decisive point. "The first rule, therefore, should be: put the largest possible army into the field."<sup>62</sup> The U.S. Army agrees with Clausewitz in its premier capstone manual, Field Manual 100-5, Operations, which states that "mass, as a principle of war, requires the Army to concentrate combat power at the decisive place and time."<sup>63</sup> In the next war, the battlefield will be characterized by massive troop concentrations aimed at achieving massive penetrations which must be blunted and interdicted at the maximum range possible to disrupt, defeat, and ultimately destroy the enemy's capacity to conduct war.

The essence of AirLand Battle Future implies the necessity for flexible, self-contained autonomous combat operations over greater depth and breadth on a nonlinear battlefield. More emphasis will be placed on offensive and continuous operations with increased security, command and control, sustainment and force agility. From an aviation perspective, the equation calls for robust air maneuver brigades organized at corps level whose sustaining capability will improve if the aviation support battalions (ASB) become a reality.

The current aviation brigade, regardless of its robustness, cannot strike deep with authority as it is deficient in major killing systems to sustain the fight against massed Soviet-styled enemy regiments. The capability to mass is as important now as it was in Clausewitz's time. The strength and skill of

the army must be manifested at the decisive point which implies that overall gross number superiority is not required for success. But the correlation of forces precisely at the point of attack is critically fundamental to ALB-F precepts.

Designing the future in peacetime to achieve success in wartime has resulted in the fielding of the tank-killing AH-64 Apache and the prototype Light Helicopter Experimental (LHX) helicopters. Developed at Fort Hood, Texas in the early seventies, the AH-64 Apache is the cornerstone of the proposed aviation division and is a significant combat multiplier in the close, deep, and rear battles. General Crosbie Saint calls the Apache the "decisive leg of the AirLand Battle triad"<sup>64</sup> while General Ostovich refers to it as the product of "airmechanization"<sup>65</sup> and "the maneuver arm to fight the decisive battle across the FLOT." The LHX, the complement to the Apache, is already being tested and will be the "largest peacetime helicopter program ever embarked on."<sup>66</sup>

Much discussion has been dedicated to attack helicopter operations in AirLand Battle. General Saint, III Corps Commander, whose same logic can be extended to the aviation division, envisaged a multi-battalion attack helicopter battle. The Apache attack helicopter, with its advanced nighttime capability to acquire, identify, designate, and engage targets, is having a significant impact on the close and deep battle which has been amply demonstrated at the CMTCs, and in Panama during Operation Just Cause. In Panama, deep battle became a function of target location in a nonlinear sense.

From a linear perspective, deep is a relative term and a function of orientation which varies from 10-30+ kilometers for the division commander, out to 75-150 kilometers and beyond for the corps commander.<sup>67</sup> ALB-F talks of 350 kilometers as the corps deep battle by the year 2000. At these distances, the division commander will want to destroy or interdict the second-echelon regiments of the first-echelon division or the first-echelon regiments of the second-echelon divisions located some 25 kilometers behind.

The corps commander, operating inside the enemy's decision cycle, is setting the conditions for future battle by interdicting second-echelon forces at a depth of 75 to 150 kilometers by interdicting the enemy where he is massed in regimental or division-sized formations. The enemy presents the most lucrative target, and is most vulnerable in assembly areas and in

approach march columns prior to his intended point of battle deployment. Ideally, attack helicopter operations will be incorporated within corps and echelons above corps (EAC) plans for air interdiction (AI), BAI and EW to achieve the maximum destruction of the enemy and protection of the force.

Although only generally oriented on terrain for movement and cover, the focus of air maneuver elements must remain force-oriented and conducted at night as much as possible for maximum effectiveness. Night operations "reduce or eliminate enemy threats presented by visual and infrared weapons systems and enemy air threats."<sup>68</sup> Currently, the only threat weapon system with any serious night capability is the SA-8, surface-to-surface missile which has 20 sub-systems tied to an integrated target acquisition and tracking radar.

The air maneuver concept is predicated on deep maneuver which is defined in FM 71-100, is an "audacious, high-speed, short duration operation whose goal is to prevent the enemy from freely maneuvering forces in depth to reinforce an attack, to shore up a defense, or to counterattack an operation of a friendly force."<sup>69</sup> Within this context, the objective of air maneuver, which must be synchronized with ground maneuver, is to aid the division or corps in the "rapid development and destruction"<sup>610</sup> of committed enemy close combat forces and uncommitted enemy forces in the deep battle. "On a larger scale, [air maneuver] could be the lever needed to spring larger forces into mobile warfare similar to the breakout of US forces at St. Lo in Normandy in 1944."<sup>611</sup>

Air maneuver relies on the innovative use of airmobile and highly lethal ground maneuver systems intended to accelerate the pace of operations whether in the attack or defense. "In contrast to air support or ground maneuver, the concept of air maneuver translates agility into expanded operational tempo."<sup>612</sup>

In air maneuver, penetration of the FLOT is one of the most difficult phases of the deep attack, and is normally accomplished with synchronized joint suppression of enemy air defenses (JSEAD). Actual crossing of the FLOT is accomplished by blowing a hole through a seam along an air avenue least defended based on the IPB. It is also possible to clandestinely ingress without JSEAD to prevent threat EW assets from acquiring a signature which would compromise the mission.

It is my belief that whatever the method of crossing the FLOT, the aviation division attack will be rapid, violent, and able to concentrate massive fires on an enemy that has been prepared for destruction by integrated battlefield air interdiction, joint air attack teams (JAAT), and supporting fires. These fires will continue as necessary to support the attack to the depths possible until a hand-off is effected as the helicopters arrive in the engagement area.

### The Essential Aviation Tasks

During execution, aviation commanders must perform certain essential tasks which transcend the combat, combat support, and combat service support roles and functions (See figure 5). These tasks require Army aviation to operate across the length and breadth of the modern battlefield.

FM 1-100, Aviation in Combat Operations, introduces criteria to examine Army aviation's capability to conduct operations across the spectrum of conflict by establishing the following four essential tasks:<sup>613</sup>

1. Support the force commander's battle plan.
2. Support forces in contact.
3. Synchronize force operations.
4. Sustain force operations.

#### **1. Support the Force Commander's (deep) Battle Plan.**

Deep operations are planned and fought primarily by the corps commander, and must be completely integrated into the commander's scheme of maneuver as early as possible. This critical step is accomplished immediately following a thorough intelligence preparation of the battlefield (IPB) and prior to the employment of organic maneuver and firepower.

However, for aviation to exploit the entire battlefield, this cannot be completed in isolation. Aviation must be employed as part of the combined arms team to maximize its effectiveness even when the mission calls for "autonomous" employment of aviation as in a cross-FLOT attack conducted by stealth and without JSEAD. Current force structure masses attack helicopter brigades at corps level and is a step in the right direction, but it still does not provide for a force of adequate strength to match larger than regimental-sized enemy forces, nor does the current structure provide for an adequate staff for command and control of augmented forces and for planning of branches and sequels. It must also be acknowledged that the aviation brigade's resources

must be husbanded and employed with caution against specific targets judged most dangerous to the mission of the corps.

It is also important to understand that, depending on the situation and outcome, the brigade could be expended rather quickly as an effective fighting force. Hence, it is even more important that the aviation division be formed to operate as a robust and autonomous combined arms force as a unit that can withstand the rigors of multiple engagements.

## 2. Support Forces in Contact

The aviation division must be capable of providing support for the forces in contact which are acting as the fulcrum in the close battle. While the ground maneuver forces fix or contain threat forces, the air maneuver brigades strike deep. The Army aviation division's inherent versatility allows it to perform this important task and a vast number of other roles across the entire range of maneuver, combat support, and combat service support operations. During actual combat, aviation forces can extend the lines of communications in a multi-faceted manner to help the commander prosecute the battle.

In this regard, a doctrinal similarity exists between the Soviet OMG concept and the US concept of exploitation as discussed in FM 100-5, Operations; FM 100-15, Corps Operations; and FM 71-100, Division Operations.<sup>614</sup> The primary mission of the OMG is to help the forces in contact by penetrating enemy defenses, assisting the advance of the main body after penetration, and to drive to subsequent and final objectives beyond the FLOT. Although this has certain linear implications, it is not unlike what Army aviation would be expected to accomplish in a linear or nonlinear environment.

## 3. Synchronize Force Operations as the Maneuver Force Headquarters in the Deep Attack.

There will never be perfect execution, but if our execution is slightly better than the enemy's, it will give us the edge that produces victory.<sup>615</sup>

The employment of the aviation division must produce the maximum combat power at the decisive point to defeat the enemy on the battlefield. The tank and the helicopter are an unbeatable combination. However, when the helicopter is bound to tank speeds, as in the close battle, economy of force and capability are lost. Just as Patton was criticized for binding his tanks to the speed of the infantry, care should be exercised to preclude the speed of

helicopters from being bound by the speed of tanks. Specific tasks for the armor and helicopter must be clearly delineated, though not necessarily mutually exclusive, and be synchronized to ensure that each serves as a complement to the other.

Air maneuver, just as its ground maneuver counterpart, is a combined arms activity, and requires synchronization with ground combat units to exploit to its fullest potential. "In air maneuver, ground maneuver elements thus bear a relation to the air maneuver force analogous to that which supporting infantry formerly bore to attacking mechanized forces."<sup>616</sup>

#### 4. Sustain Force Operations for cross-FLOT deep attack.

The aviation division must be able to self-sustain, particularly for short periods, when maneuvering across the FLOT. One way to obviate FARPS is by fighting brigade-sized elements massed to make one pass each. In this case, Douhet might assume total destruction of the enemy; however, as Clausewitz points out, the reality of "fog and friction" will more often than not preclude absolute success.

Consequently, since multiple passes or subsequent and follow up missions are anticipated, sustainment has critical implications. Aviation is logistics-intensive; therefore, procedures for rapid resupply, repair, and recovery must be established for forward support. Sustainment requirements are unique for every contingency. To maintain agility, units need only take what is necessary to accomplish their immediate mission then be prepared to live off the land, host nation support, or partisans until CSS can link up with the operational force.

The aviation support battalion (ASB), one per brigade, will provide aviation maintenance and supply in much the same way that the Forward support battalion (FSB) supports a ground maneuver brigade. This organic feature of future aviation provides a much needed streamlined service without question to competing priorities and intervening chains of command as in the past. This concept will significantly improve the aviation division's ability to conduct operations across the spectrum of conflict in general, and in particular across the FLOT. Additionally, the smaller signature produced by individual ASBs will allow even more forward support and preclude frequent flights and recoveries to the corps rear for maintenance.

### Limitations

Adverse weather conditions and smoke (the LONGBOW AH-64 mast mounted sight scheduled FY 91 fielding will eliminate weather and obscuration problems) may inhibit navigation, target acquisition, and fires of Ai, BAI and helicopters. It is also during these periods that the enemy will take advantage of the opportunity to move rapidly as far forward as possible.

The general availability and responsiveness of BAI assets could also be a limitation for helicopter operations. This will drive the commander's plan for the employment of aerial maneuver at specific points in the battle to locations ranging from immediately across the FLOT out to 150 kilometers deep depending on the IPB and the factors of mission, enemy, troops, terrain, and time (METT-T). Lack of supporting systems or a desire to cross the FLOT using stealth may result in dangerously autonomous excursions into enemy controlled terrain.

Enemy fixed and rotary wing counterair will be a persistent threat to the success of the deep attack. "The air itself is air maneuver's most vulnerable flank."<sup>617</sup> Consequently, air maneuver requires a synchronized and sophisticated offensive counterair coverage, and internal self-defense capabilities coupled with JSEAD.

Lastly, just as multiple FARPS provide redundancy to avert problems in cross-FLOT operations, they also may cause problems. The location of multiple FARPS must be carefully integrated into the planning phase, and be clearly understood by the crews at the air mission briefing to prevent misorientation resulting in fuel starvation when returning to the friendly side of the FLOT. Additionally, limited Class III and V personnel and equipment are available to service multiple FARPS in support of massive deep operations.

### CHAPTER 7. CONCLUSIONS

Are we looking for 'silver bullets' to win or deter war?  
Idea must be capable of winning the war!<sup>618</sup>

The purpose of this paper was to argue the merits of formalizing what has in many respects has conceptually already occurred - the organization of an Army aviation division. The historical precedents, in particular from Vietnam to present, lend credibility to the assertion that massed attack helicopters represent a tremendous amount of firepower capable of placing extremely

accurate and lethal fires onto enemy armored forces which comprise our most serious ground threat.

Helicopters also contribute as an economy of force mission to attrite the enemy from stand-off ranges thus obviating needless friendly casualties in the close battle. The argument is supportable from both a historical and theoretical perspective, and has potential for practical, common sense application in the present using a techno-human combination that our adversaries cannot replicate.

Additionally, this monograph finds that the Army Aviation division is not only viable for AirLand Battle Future, but is the most logical and economical application of massed combat power. It is not designed to work in isolation, but is enjoined and complemented by Air Forces, artillery and electronic warfare, and only rarely will it be assigned an autonomous mission.

This study also concludes that the organization of the Army aviation division is not only justifiable, but that a compelling case has been made for its organization. Moreover, its creation would merely formalize the ad hoc task organizations that are already taking place in computerized battle simulations and, indeed, in the field. It is interesting to observe that field commanders, when faced with a real-world threat, will apply whatever force necessary in whatever form necessary to defeat the enemy. Forming an aviation division predicts how what field commanders will do when faced with a crisis of major proportion that requires massed firepower to defeat large armored concentrations. It is apparent that we will fight this way; therefore, it is incumbent upon us to organize and train in the same manner.

This monograph finds that an Army aviation division is not only a viable third dimension transition to AirLand Battle Future, but is the most logical and economical application of massed combat power at the disposal of the corps commander. As examined within, the formulation of the Army aviation division best prepares us for success in our future "First Battles".

Additionally, this treatise concludes that the helicopter will continue to evolve technologically as the combat vehicle of choice, and that the aviation division is the ideal sized organization for the massed employment of its state-of-the-art combat firepower in the deep attack.

## CHAPTER 8. IMPLICATIONS

Former Chairman of the Joint Chiefs Admiral William J. Crowe has characterized the imbalance in conventional forces as "horrrifying."<sup>81</sup>

I do not believe that the world situation has changed so radically since the tenure of the former CJCS ended that the need for massed fires in the most expeditious and efficacious manner possible is no longer a valid concept. All the more reason to expand our human, technological and tactical combat multipliers to win not only the first battle, but to avert battle altogether as an overwhelming deterrent force.

As the corps gets the enhanced opportunity to employ an adequate maneuver force to fight the deep battle, we still may have to overcome some institutional inertia that hinders change in the face of enduring traditions. Just as the elevation of Army aviation to full-fledged combat and maneuver arm status implied an education process and challenges to overcome, those same tradition-laden challenges will have to be surmounted as the Army aviation division is formed.

(Figure 7) Detailed SWA Scenario Timeline

Day- D+1: 1. Division commander pushes out reconnaissance squadron with the MI company (-) unmanned aerial vehicles (AGUILA/TACIT RAINBOW).

2. Conducts delay with JAAT.

3. Apply wild weas to 21/22 Tank Divisions.

4. Begin MLRS (Block II) movement.

Night, D+1: Mission - Destroy the 21st TD.

- Destroy 1/2 of the 22nd TD.

- MLRS with ATCMS SEAD.

Day - D+2: Continue Destruction of 22d TD and 23d TD.

- Apply JAAT to Logistics tail - force ADA to rear.

- Air assault HMMWV-TOW TF into flank of log column dusk attack.

- Begin counter mobility (GATOR/VOLCANO) for night D+2.

Night - D+2: Option 1. the 22 TD/23 TD continues to move.

- Repeat AH-64 attack.

- Enhanced with ATCMS (ATTACMS).

Night - D+2: Option 2. The 22 TD/23 TD digs in.

- Precision MLRS/ATTACMS.

- Air assault raid with TOW HMMWV.

Night - D+2 or Day D+3: Exploitation and pursuit.

## Endnotes

### CHAPTER 1.

- <sup>1</sup> Chris Bellamy, The Future of Land Warfare. (New York: St Martin's Press, 1987), p. 20.
- <sup>2</sup> Charles E. Heller and William A. Stott, America's First Battles: 1776-1965. (Lawrence, Kansas: The Kansas University Press, 1986), p. ix.
- <sup>3</sup> Field Manual 100-5, Operations. (Washington, D.C.: U.S. Government Printing Office, 5 May 1986), p. 5.
- <sup>4</sup> William Darryl Henderson, The Hollow Army: How the U.S. Army is Oversold and Undermanned. (New York: Greenwood Press, 1990), p. 2.
- <sup>5</sup> William Darryl Henderson, Conesion: The Human Element in Combat. (Washington, D.C.: National Defense University Press, 1985), p. 17.
- <sup>6</sup> *Ibid.*, p. 49.
- <sup>7</sup> *Ibid.*, p. 54.
- <sup>8</sup> Major Paul H. Herbert, Deciding What has to be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations. (Fort Leavenworth, Kansas: Fort Leavenworth Papers; no. 16, 1988), p. 9.
- <sup>9</sup> "USACGSC Directors Guide: Read Ahead Packet for Future- AirLand Battle." (Command and General Staff College, attn: ATZL-SWO-P (310-2r), Colonel David Fishback, Fort Leavenworth, Kansas, 66027, July 1990), p. 2-2.
- <sup>10</sup> Lieutenant Colonel Clayton R. Newell, "The Technological Future of War." Military Review. (October 1989), p. 24-25.
- <sup>11</sup> "A Plan for the Army in Transition: Training and Doctrine Command AirLand Battle Future Briefing for the Army Chief of Staff." (Headquarters, United States Army Combined Arms Center, Fort Leavenworth, Kansas, 66027, October 1990), p. 1.
- <sup>12</sup> *Ibid.*, p. 9.
- <sup>13</sup> *Ibid.*, p. 9.
- <sup>14</sup> Major William M. Jacobs, "82d Aviation Brigade Deploys to Honduras." Aviation Digest. (July/August 1989), p. 53.
- <sup>15</sup> "A Plan for the Army in Transition: Training and Doctrine Command AirLand Battle Future Briefing for the Army Chief of Staff." (Headquarters, United States Army Combined Arms Center, Fort Leavenworth, Kansas, 66027, October 1990), p. 60.
- <sup>16</sup> Field Manual 1-100, Army Aviation in Combat Operations. (Washington, D.C.: U.S. Government Printing Office, February 1989), p. 1-7.
- <sup>17</sup> Richard E. Simpkin, Antitank: An Airmechanized Response to Armored Threats in the 90's. (Oxford: Brassey's Publishers, Ltd., 1982), p. 272.
- <sup>18</sup> FM 1-100, p. 2-1.
- <sup>19</sup> Major Steve Baribeau, Major Mark Curran, Major Craig Pearson, Major Frank Tadconio, and Major Mark Webb, "Employment of Combat Aviation", Aviation White Paper. (Unpublished AMSP White Paper, Fort Leavenworth, Kansas 66027, 28 September 1988), p. 3.

### CHAPTER 2.

- <sup>41</sup> Carl von Clausewitz, On War. Edited and translated by Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1976), p. 119.
- <sup>44</sup> Pierre Sorey, Translation of Taped Conversation with General Hermann Balck, 12 January 1974 and Brief Biographical Sketch. (Columbus, Ohio: Battelle, 1979), p. 22.

23 E. B. Potter, ed. Sea Power: A Naval History. (Annapolis, Maryland: Naval Institute Press, 1981), p. 161.

24 General Doctor F.M. von Senger und Etterlin, "New Operational Dimensions." (Lecture) RUSI Journal, (June 1983), p. 13.

25 J.F.C. Fuller, Armored Warfare. (Harrisburg, PA: The Telegraph Press, 1943), p. 27.

26 Field Manual 100-5, Operations. (Washington, D.C.: U.S. Government Printing Office, 5 May 1986), p. 38-39.

27 Major James A. Marks, "OMG in US Army Doctrine." Military Review, (June 1989), p. 42.

28 General Doctor F.M. von Senger und Etterlin, "The Air-Mobile Divisions: Operational Reserves for NATO." RUSI Journal, (1 March 1987), p. 110.

29 General Doctor F.M. von Senger und Etterlin, "New Operational Dimensions." (Lecture) RUSI Journal, (June 1983), p. 12.

210 Ibid., p. 12.

211 Ibid., p. 12.

212 Lieutenant Colonel F.O. Miksche, War Between the Continents. (London: Faber and Faber Ltd.), 1948, p. 146.

213 Von Senger und Etterlin Lecture, p. 15.

214 Chris Bellamy, The Future of Land Warfare. (New York: St Martin's Press, 1987), p. 206.

215 Richard E. Simpkin, Race to the Swift: Thoughts on Twenty-First Century Warfare. (London: Brassey's Defence Publishers, 1985), p. 119.

216 Ibid., p. 121.

217 Ibid., p. 121-2.

218 Ibid., p. 123.

219 Ibid., p. 124.

220 Ibid., p. 129.

221 Richard E. Simpkin, Race to the Swift: Thoughts on Twenty-First Century Warfare. (London: Brassey's Defence Publishers, 1985), p. 131.

222 Ibid., p. 140-1.

223 Alfred T. Mahan, Sea Power in its Relations to the War of 1812. (London: 1905), p. 316.

224 Richard E. Simpkin, Race to the Swift: Thoughts on Twenty-First Century Warfare. (London: Brassey's Defence Publishers, 1985), p. 143.

225 B.H. Liddell-Hart, Strategy. (New York: Praeger Publishers, 1967), p. 346.

226 Ibid., p. 336.

### CHAPTER 3.

31 James A. Huston, The Center for Military History United States Army, "Army Historical Series". The Sinews of War: Army Logistics 1775-1953. (Washington, D.C.: U.S. Government Printing Office, 1966), p. 624.

32 Chris Bellamy, The Future of Land Warfare. (New York: St Martin's Press, 1987), p. 290.

33 Andrew F. Jr., Krepinevich, The Army and Vietnam. (Baltimore: The Johns Hopkins University Press, 1966), p. 114-5.

34 Ibid., p. 115.

35 Ibid., p. 115.

36 Ibid., p. 116-7.

37 Ibid., p. 118.

30 Ibid., p. 123.

39 Brigadier General (Retired) John C. "Doc" Bahnsen, "A Mobile Division for Future War". Military Review, (June 1989), p. 27.

310 Paddy Griffith, Forward into Battle: Fighting Tactics from Waterloo to Vietnam. (Sussex, England: Antony Bird Publications LTD, 1981), p. 123.

311 "USACGSC Directors Guide: Read Ahead Packet for Future- Airland Battle," (Command and General Staff College, attn: ATZL-SWO-P (310-2r), Colonel David Fishback, Fort Leavenworth, Kansas, 66027, July 1990), p. D-6.

312 Lieutenant Colonel Kenneth R. Pierce, "The Battle of Ia Drang Valley." Military Review, (January 1989), p. 89.

313 Charles E. Heller and William A. Stoft, America's First Battles: 1776-1965. (Lawrence, Kansas: The Kansas University Press, 1986), p. 304.

314 Lieutenant Colonel Kenneth R. Pierce, "The Battle of Ia Drang Valley." Military Review, (January 1989), p. 90.

315 Charles E. Heller and William A. Stoft, America's First Battles: 1776-1965. (Lawrence, Kansas: The Kansas University Press, 1986), p. 304.

316 Ibid., p. 322.

317 Edward N. Luttwak and Daniel Horowitz, The Israeli Army, 1948-1973. (New York: University Press of America, 1983), p. 246; and Avigdor Kananian, The Heights of Courage: A Tank Leader's War on the Golan. (Westport, CT: Greenwood Press, 1984), p. 94.

318 Captain Laura L. Tewes, "The Israeli Air Force and the 1982 Lebanon War: 'Operation Peace for Galilee'." Aviation Digest, (July/August 1990), p. 60.

319 Lieutenant Colonel Kenneth Kimes, "Israeli's Combat Helicopters." Defence Update International, (No. 67, 1986), p. 10.

320 Ibid., p. 4.

321 Captain Laura L. Tewes, "The Israeli Air Force and the 1982 Lebanon War: 'Operation Peace for Galilee'." Aviation Digest, (July/August 1990), p. 65.

322 Richard A. Gabriel, Operation Peace for Galilee: The Israeli-PLO war in Lebanon. (New York: Hill and Wang, 1984), p. 212.

323 Captain Laura L. Tewes, "The Israeli Air Force and the 1982 Lebanon War: 'Operation Peace for Galilee'." Aviation Digest, (July/August 1990), p. 65.

324 Anthony H. Cordesman, The Iran-Iraq War and Western Security 1984-87: Strategic Implications and Policy Options. (New York: Jane's Publishing, Inc., 1987), p. 103.

325 Ibid., p. 103.

#### CHAPTER 4.

41 Brigadier General (Retired) John C. "Doc" Bahnsen, "A Mobile Division for Future War". Military Review, (June 1990), p. 30.

42 Ibid., p. 30.

43 Field Manual 1-100, Army Aviation in Combat Operations. (Washington, D.C.: U.S. Government Printing Office, February 1989), p. 2-1.

44 Field Manual 1-111, Aviation Brigades. (Washington, D.C.: U.S. Government Printing Office, August 1990), p. 1-5.

45 Jonathan Moyle, French Fire Brigade: Good Command, Control, Communications and Intelligence are Critical to the Success of the 4th Airmobile Division." Defence Helicopter World, (October-November 1989), p. 2.

46 German "Army Structure 2000" briefing, author and date unknown. Federal (FRG) Armed Forces Plan, 1990, p. 32.

47 Ibid., p. 62.

48 Oberst (German Army Colonel) I.G. von Kirchbach, "Einsatz Luftbeweglicher Kräfte im Rahmen Operativer Gegenangriffe." Soldat und Technik, (Februaury 1988) p. 77.

49 German "Army Structure 2000" briefing, author and date unknown. Federal (FRG) Armed Forces Plan, 1990, p. 33.

410 "USACGSC Directors Guide: Read Ahead Packet for Future- AirLand Battle," (Command and General Staff College, attn: ATZL-SWO-P (310-2r), Colonel David Fishback, Fort Leavenworth, Kansas, 66027, July 1990), p. D-2.

411 Field Manual 100-5, Operations. (Washington, D.C.: U.S. Government Printing Office, 5 may 1986), p. 31.

#### CHAPTER 5.

51 "A Plan for the Army in Transition: Training and Doctrine Command AirLand Battle Future Briefing for the Army Chief of Staff," (Headquarters, United States Army Combined Arms Center, Fort Leavenworth, Kansas, 66027, October, 1990), p. 27.

52 Lieutenant Colonel Stuart H. Watkins and Major Michael J. Barron, "Air Maneuver on the Modern Battiefeld." Military Review (July 1989), p. 49.

53 Ibid., p. 5u.

#### CHAPTER 6.

61 Lieutenant General Crosbie E. Saint and Colonel Walter H. Yates Jr., "Attack Helicopter Operations in the AirLand Battle: Deep Operations." Military Review, (July 1988), p. 3.

62 Carl von Clausewitz, On War. Edited and translated by Michael Howard and Peter Paret. (Princeton, NJ: Princeton University Press, 1976), p. 195.

63 Field Manual 100-5, Operations. (Washington, D.C.: U.S. Government Printing Office, 5 may 1986), p. 174.

64 Saint, Lieutenant General Crosbie E. and Yates, Colonel Walter H. Jr., "Attack Helicopter Operations in the AirLand Battle: Close Operations." (Military Review), June 1988), p. 2.

65 Major General Rudolon Ostovich III. "Aviation Doctrine: Tactics, Techniques and Procedures." Aviation Digest, (March/April 1990), p. 1.

66 Chris Beilamy, The Future of Land Warfare. (New York: St Martin's Press, 1987), p. 203.

67 Lieutenant General Crosbie E. Saint and Colonel Walter H. Yates Jr., "Attack Helicopter Operations in the AirLand Battle: Deep Operations." Military Review, (July 1988), p. 2.

68 Ibid., p. 6.

69 Colonel L.D. Holder, "Maneuver in the Deep Battle." Military Review (May 1982), p. 54.

610 Lieutenant Colonel Stuart H. Watkins and Major Michael J. Barron, "Air Maneuver on the Modern Battiefeld." Military Review (July 1989), p. 51.

611 Ibid.

612 Ibid.

613 Field Manual 1-100, Army Aviation in Combat Operations. (Washington, D.C.: U.S. Government Printing Office, February 1989), p. 1-7.

614 Major James A. Marks, "UMG in US Army Doctrine." Military Review, (June 1989), p. 38.

615 unknown quote.

616 Lieutenant Colonel Stuart H. Watkins and Major Michael J. Barron, "Air Maneuver on the Modern Battlefield," Military Review (July 1989), p. 51.

617 Major Steve Baribeau, Major Mark Curran, Major Craig Pearson, Major Frank Taddonio, and Major Mark Webb. "Employment of Combat Aviation", Aviation White Paper. (Fort Leavenworth, Kansas, AMSP, 28 September 1988), p. 11.

#### CHAPTER 7.

71 Major General Rudolph Ostovich III, Commander US Army Aviation Center and Fort Rucker, Alabama, Remarks at Fort Leavenworth General Officer Steering Meeting, September, 1990.

#### CHAPTER 8.

81 Admiral William J. Crowe Jr., Chairman of the Joint Chiefs of Staff, cited by David Wood, "Kremlin Stealthily Amasses Strike Force in Europe," Newark Star-Ledger, December 8, 1987), p. 44.

## Bibliography

### Manuals

Department of the Army. Army Aviation Modernization Plan. Washington D.C.: U.S. Government Printing Office, May 1988.

Field Manual 1-100, Army Aviation in Combat Operations. Washington, D.C.: U.S. Government Printing Office, February 1989.

Field Manual 1-111, Aviation Brigades. Washington, D.C.: U.S. Government Printing Office, August 1990.

Field Manual 1-117, Air Reconnaissance Squadron. Washington, D.C.: U.S. Government Printing Office, May 1989.

Field Manual 71-3, Armored and Mechanized Infantry Brigade. Washington, D.C.: U.S. Government Printing Office, May 1988.

Field Manual 100-5, Operations. Washington, D.C.: U.S. Government Printing Office, 5 May 1986.

Field Manual 100-10, Combat Service Support. Washington, D.C.: U.S. Government Printing Office, 18 February 1988.

Handbook Corps Deep Operations: Tactics, Techniques, and Procedures. Fort Leavenworth, KS: Combined Arms Center, April, 1990.

### Books

Appelman, Roy E. The U.S. Army in the Korean War: South to the Nakdong, North to the Yalu. Washington, D.C.: Center for Military History United States Army, 1986.

Clausewitz, Carl von. On War. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.

Bellamy, Chris. The Future of Land Warfare. New York: St Martin's Press, 1987.

Conen, Elliot A. and Gooch, John. Military Misfortunes: The Anatomy of Failure in War. New York: The Free Press (Macmillan), 1990.

Cordesman, Anthony H. The Iran-Iraq War and Western Security 1984-87: Strategic Implications and Policy Options. New York: Jane's Publishing, Inc., 1987.

Douner, Giulio. The Command of the Air. Trans. Dino Ferrari. Washington: Office of Air Force History, 1983.

Fuller, J.F.C. Armored Warfare. Harrisburg, PA: The Telegraph Press, 1943.

\_\_\_\_\_. Armored Warfare: an annotated edition of lectures on U.S.R. III (operation between mechanized forces). Westport, CT: Greenwood Press, 1983.

Gabriel, Richard A. Operation Peace for Galilee: The Israeli-PLO War in Lebanon. New York: Hill and Wang, 1984.

Glosson, James W. The Perfect War: the War We Couldn't Lose and How We Did. New York: Random House, 1988.

Griffith, Paddy. Forward into Battle: Fighting Tactics from Waterloo to Vietnam. Sussex, England: Antony Bird Publications Ltd, 1981.

Hastings, Max and Jenkins, Simon. The Battle for the Falklands. New York: W.W. Norton & Company, 1983.

Herbert, Major Paul H. Deciding What has to be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations. Fort Leavenworth, Kansas: Fort Leavenworth Papers: no. 16, 1988.

Meier, Charles E. and Stott, William A. America's First Battles: 1776-1965. Lawrence, Kansas: The Kansas University Press, 1966.

Henderson, William Darryl. Coresion: The Human Element in Combat. Washington, D.C.: National Defense University Press, 1985.

\_\_\_\_\_. The Hollow Army: How the U.S. Army is Oversold and Undermanned. New York: Greenwood Press, 1990.

Herzog, Chaim. The Arab-Israeli Wars: War and Peace in the Middle East from the War of Independence through Lebanon. New York: Vintage Books, 1984.

Hoopes, Townsend. The Limits of Intervention. New York: David McKay Co., 1969.

Hurlev, Alfred F. Billy Mitchell: Crusader for Air Power. Bloomington, Indiana: Indiana University Press, 1975.

Huston, James A. The Center for Military History United States Army, "Army Historical Series". The Sinews of War: Army Logistics 1775-1953. Washington, D.C.: U.S. Government Printing Office, 1966.

Jomini, Baron de. The Art of War. Translated by Capt. G.H. Mendell and Lieut. W.P. Craighill. Westport, CT: Greenwood Press, 1977.

Kanalani, Avigdor. The Heights of Courage: A Tank Leader's War on the Golan. Westport, CT: Greenwood Press, 1984.

Klein, Robert Edward. J.F.C. Fuller and the Tank. Chicago: University of Chicago, Joseph Kegenstein Library, Dept. of Photoduplication, 1983.

Krepinevich, Andrew F. Jr. The Army and Vietnam. Baltimore: The Johns Hopkins University Press, 1986.

Liddell-Hart, B.H. Strategy. New York: Praeger Publishers, 1967.

Luttwak, Edward N. and Horowitz, Daniel. The Israeli Army, 1948-1973. New York: University Press of America, 1983.

Manan, Alfred. T. Sea Power in its Relations to the War of 1812. London: 1905.

Miksche, Lieutenant Colonel F.O. Unconditional Surrender: The Roots of a World War III. London: Faber and Faber Ltd., 1952.

\_\_\_\_\_, and E. Combaux. War Between Continents. London: Faber and Faber Ltd., 1948.

Palmer, David Richard. Summons of the Trumpet. San Rafael, California: Presidio Press, 1978.

Posen, Barry R. The Sources of Military Doctrine. Ithaca, NY: Cornell University Press, 1984.

Porter, E.B., ed. Sea Power: A Naval History. Annapolis, Maryland: Naval Institute Press, 1981.

von Senger und Etterlin und Etterlin, Frido von. Neither Fear nor Hope: The Wartime Career of General von Senger und Etterlin und Etterlin, Defender of Cassino. Novato, CA: Presidio Press, 1989.

Simpkin, Richard E. Antitank: An Airmechanized Response to Armored Threats in the 90's. Oxford: Brassey's Publishers, Ltd., 1982.

\_\_\_\_\_. Race to the Swift: Thoughts on Twenty-First Century Warfare. London: Brassey's Defence Publishers, 1985.

\_\_\_\_\_. Tank Warfare. New York: Crane Russak and Co., Inc., 1979.

Sprey, Pierre. Translation of Taped Conversation with General Hermann Balck, 12 January 1977 and Brief Biographical Sketch. Columbus, Ohio: Battelle, 1979.

Iukhnachevskiy, Mikhail. "New Problems in Warfare". U.S. Army War College Art of War Colloquium: Soviet Operational Concepts by Various Authors. Carlisle, PA: U.S. Army War College, November 1983.

United States Army. Weapons Systems 1990: United States Army. Washington D.C.: United States Government Printing Office, 1990.

Van Creveld, Martin. Supplying War: Logistics from Wallenstein to Patton. London: Camoridge University Press, 1977.

Warden, Colonel John A. The Air Campaign: Planning For Combat. Washington: Pergamon-Brassey, 1988.

Watts, Lieutenant Colonel Barry D. The Foundations of US Air Doctrine: The Problem of Friction in War. Maxwell Air Force Base, Alabama: Air University Press, 1984.

#### Articles

Bannsen, Brigadier General (Retired) John C. "Doc", and Stack, Colonel (Retired) Robert C. "A Mobile Division for Future War". Military Review, (June 1990), pp. 27-37.

Bingham, USAF Lieutenant Colonel Price T. "NATO Needs a New Air Interdiction Approach: Air Power and the Warsaw Pact". Armed Forces Journal International, (October 1986), pp. 98-112.

Brinkley, Colonel William A. "The Cost Across the FLOT." Military Review, (September 1986), pp. 30-41.

Butler, Dr. Howard K. "The Army Ground Forces and the helicopter, 1941 to 1945." Aviation Digest, (May/June 1990), p. 8-13.

Colucci, Frank. "Renearsai Reaps Rewards: The Invasion of Panama put U.S. Helicopters in Combat." Defence Helicopter World, (June-July 1990), pp.16-24.

Crawford, CPT Darrell E. "Airborne Aviation: Training as We Fight." Army Aviation, (May 31, 1986), pp. 44-46.

Curtin, James. "Aviation Logistics: Division Aviation Support Battalion." Aviation Digest, (March/April 1990), pp. 36-39.

Granam, Captain Douglas M. "The Scout in the AH-64 Battalion." Army Aviation, (31 October 1989), pp.20+.

Guest, Kenneth. "Dragon Slayers." Defence Helicopter World, (June-July 1990), pp. 44-47.

Hoiger, Colonel L.D. "Maneuver in the Deep Battle." Military Review (May 1982), pp. 54-61.

Howze, General Hamilton H. "The Howze Board, Part III: Winding Up a Great Show." Army, (April 1974), pp. 18-24.

Jacobs, MAJ William M. "82d Aviation Brigade Deploys to Honduras." Aviation Digest, (July/August 1989), pp. 48-53.

Kimes, Lieutenant Colonel Kenneth. "Israeli's Combat Helicopters." Defence Update International, (No. 67, 1986), p. 10.

Kinnard, Lieutenant General Harry W.O. "A Victory in Ia Drang: The Triumph of a Concept." Army, (September 1967), pp.71-91.

Kirchbach, Oberst (German Army Colonel) I.G. von. "Einsatz Luftbeweglicher Kräfte im Rahmen Operativer Gegenangriffe." Soldat und Technik, (February 1988) pp. 70-77.

Lind, William S. "Some Doctrinal Questions for the United States Army." Military Review, (March 1977), pp. 54-65.

Luttwak, Edward N. "The American Style of Warfare and the Military Balance." Survival, (January/February 1979), pp. 57-60.

Marks, Major James A. "OMG in US Army Doctrine." Military Review, (June 1989), pp. 38-42.

McGinty, Lieutenant Colonel Kenneth R. and Brockman, Captain Gregory A. "Cross FLOT with the AH-64 Apache." Aviation Digest, (January 1987), pp. 2-5.

Moyle, Jonathan. French Fire Brigade: Good Command, Control, Communications and Intelligence are Critical to the Success of the 4th Airmobile Division." Defence Helicopter World, (October-November 1989), pp. 2-8.

Neims, Douglas W. "Not Looking for Aerial Combat But Ready, Able." Army, (August 1990), pp. 44-51.

Newell, Lieutenant Colonel Clayton R. "The Technological Future of War." Military Review, (October 1989), pp. 22-28.

Nowak, Colonel Leonard G. "Operational IEW and the Corps Deep Attack." Military Intelligence, (March 1987), pp. 7-10.

Ostovich, Major General Rudolph III. "Aviation Doctrine: Tactics, Techniques and Procedures." Aviation Digest, (March/April 1990), p. 1.

\_\_\_\_\_. "Army Aviation: A Relevant Force for the Future." Aviation Digest, (May/June 1990), p. 1.

\_\_\_\_\_. "Army Aviation: Lethal, Versatile, and Deployable." Army, (August 1990), pp. 20-24.

Pierce, Lieutenant Colonel Kenneth R. "The Battle of Ia Drang Valley." Military Review, (January 1989), pp. 87-97.

Rose, Colonel John P., LTC John E. Peters, and LTC Michael A. Pandolfo. "What Will the Army Look Like in 2010?" Army, (July 1988), pp. 18-24.

Saint, Lieutenant General Crosbie E. and Yates, Colonel Walter H. Jr. "Attack Helicopter Operations in the AirLand Battle: Deep Operations." Military Review, (July 1988), pp. 2-9.

\_\_\_\_\_. "Attack Helicopter Operations in the AirLand Battle: Close Operations." Military Review, (June 1988), pp. 2-15.

\_\_\_\_\_. "Attack Helicopter Operations in the AirLand Battle: Rear Operations." Military Review, (October 1988), pp. 2-10.

Von Senger und Etterlin und Etterlin, General Doctor F.M. von. "The Air-Mobile Divisions: Operational Reserves for NATO." RUSI Journal, (1 March 1987), pp. 23-30.

\_\_\_\_\_. "New Operational Dimensions." (Lecture) RUSI Journal, (June 1983), 11-15.

Simpkin, Richard E. "Flying Tanks?--A Tactical-Technical Analysis of the 'Main battle air vehicle'." Military Technology, (August 1984), pp. 62-80.

\_\_\_\_\_. "Airmechanized Forces for the '90s." Armor, (July-August 1981), pp. 54-57.

Stanton, Shelby L. "Lesson Learned or Lost: Air Cavalry and Airmobility." Military Review, (January 1989), pp. 74-86.

Studos, Kevin D. "Beyond the Army of Excellence." Military Review, (August 1988), pp. 24-41.

Tewes, Captain Laura L. "The Israeli Air Force and the 1982 Lebanon War: Operation Peace for Galilee." Aviation Digest, (July/August 1990), pp. 60-65.

Vound, General Carl E. "Army Aviation in a Changing World." Army Aviation, (30 June 1990), p. 6+.

Watkins, Lieutenant Colonel Stuart H. and Barron, Major Michael J. "Air maneuver on the Modern Battlefield." Military Review, (July 1989), pp. 49-56.

wheeler, Major General Albin G. "Operational Logistics in Support of the Deep Attack." Military Review, (February 1986), pp. 12-19.

#### Manuscripts

"A Plan for the Army in Transition: Training and Doctrine Command AirLand Battle Future Briefing for the Army Chief of Staff," (Headquarters, United States Army Combined Arms Center, Fort Leavenworth, Kansas, 66027, October, 1990).

"USACGSC Directors Guide: Read Ahead Packet for Future- AirLand Battle," (Command and General Staff College, attn: ATZL-SWO-P (310-2r), Colonel David Fisenback, Fort Leavenworth, Kansas, 66027, July 1990).

"Aviation Requirements for the Combat Structure of the Army IV." (ARCSA IV), Final Report Department of the Army, Headquarters, United States Army Training and Doctrine Command, Fort Monroe Virginia, 23651. (22 February 1985).

"Air Cavalry Operations in the Delta." Headquarters, United States Army Vietnam, APO SF 96375. (18 December 1968).

Baribeau, Major Steve, Major Mark Curran, Major Craig Pearson, Major Frank Tadonilo, and Major Mark Webb. "Employment of Combat Aviation", Aviation White Paper. (28 September 1988).

Combined Arms Center Development Activity. "Armored Family of Vehicles." Fort Leavenworth, Kansas: Unpublished CACDA White Paper, (9 September 1985).

Carroll, Major Walton C. "U.S. Army Petroleum Supply Capability is insufficient to Meet the Demands of Army Aviation on the Modern Battlefield." Fort Leavenworth, KS: Unpublished MMAS Thesis, (1988).

German "Army Structure 2000" briefing, author and date unknown. Federal (FRG) Armed Forces Plan. (1990).

Giantz, COL David M. "The Soviet Conduct of War." Fort Leavenworth, Kansas: Soviet Army Studies Office Staff Study, (30 March 1987).

Herbert, Major Paul H. "Deciding What Has to be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations." Leavenworth Papers number 16. Fort Leavenworth, Kansas: Combat studies Institute, (July, 1988).

Hood, Carlton L. "Determining the Optimum Aviation Organization for the Operational Level of War." Fort Leavenworth, Kansas: Unpublished MMAS Thesis, (1984).

Hussain, Farooq, Ian Kemp, and Phillip McCarty. "The Future of the Military Helicopter." London: Whithall Papers, Royal United Services Institute for Defence Studies, (1986).

Mowery, Lieutenant Colonel James L. "The Division Aviation Brigade: Operational or Tactical?" Ft. Leavenworth, KS: Unpublished AOSF Monograph, (4 May 1987).

Packett, Virgil L., II. "Airmechanization: The Direction and Dynamics of Army Aviation from a Combined Arms Perspective." Ft. Leavenworth, KS: Unpublished MMAS Thesis, (1985).

Sinnreich, Colonel Richard Hart et al. "Employment of Combat Aviation." Ft. Leavenworth, KS: Unpublished SAMS White Paper, (April 1986).

Tanksley, Major David M. "What is the Soviet OMG and what are its implications for the U.S. Army's AirLand Battle Doctrine?" Ft. Leavenworth, KS: Unpublished MMAS Thesis, (1984).

Wass de Czege, Colonel Huba. "Understanding and Developing Combat Power." Ft. Leavenworth, KS: Unpublished Monograph, (10 February 1984).

Webb, Major George S. "Prescription for the Counterstroke: The Airmechanized Division at the Operational Level of War." Ft. Leavenworth, KS: Unpublished SAMS Monograph, (15 May 1986).

USACGSC Directors OPD Read Ahead Packett, "Future- AirLand Battle." Ft. Leavenworth, KS. (31 July 1990).

#### Newspapers

Crowe, Admiral William J. Jr., Chairman of the Joint Chiefs of Staff, cited by David Wood, "Kremlin Stealthily Amasses Strike Force in Europe," Newark Star-Ledger, (December 8, 1987), p. 44.